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TRUST WIDE DOCUMENT

Delete as appropriate	Clinical Guideline and Clinical Pathways
DOCUMENT TITLE:	Venous Thromboembolism(VTE): Reducing the Risk of Hospital-Acquired Deep Vein Thrombosis or Pulmonary Embolism in Patients aged 16 and over
DOCUMENT NUMBER:	ELHT/CP17 Version 2.3
DOCUMENT REPLACES Which Version	CP17 V2.2 Venous Thromboembolism (VTE) Part I Prophylaxis
LEAD EXECUTIVE DIRECTOR DGM	Chair of Clinical Effectiveness Committee
AUTHOR(S): Note should not include names	Chair of VTE Committee (Associate Medical Director for Appraisal & Revalidation and Consultant Gynaecologist) Haematology Consultant Lead for VTE Committee Assistant Director of Pharmacy
TARGET AUDIENCE:	All Trust Personnel
DOCUMENT PURPOSE:	This document outlines the evidence based guidelines that should be followed to ensure appropriate assessment and prophylaxis of venous thromboembolism for reducing risk in patients aged 16 and over
To be read in conjunction with (identify which internal documents)	C06- V5 Medicines Management policy C003- V4.2 Incident Reporting Policy C012- V8.1 Policy and Protocols for Investigation and Root Cause Analysis of Incidents, Complaints and Claims and Policy for Associated learning across the Organisation. ELHT Oral Anticoagulation Guidelines (warfarin / vitamin K antagonists) Best Practice Guidance 2019, East Lancashire Health Economy Medicines Management Board - Use of Low Molecular Weight Heparin www.elmmb.nhs.uk The Peri-Procedural Management of patients on Oral Anti-Coagulants & Anti Platelets V2 March 2018
SUPPORTING REFERENCES	1. NICE clinical guideline NG89: Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism (this has now replaced earlier CG092 (2010 &2015) Venous thromboembolism: reducing the risk. Available at www.nice.org.uk/guidance/ng89 2.NICE Quality Standard 29 (March 2018 replaces March 2013 v) Venous Thromboembolism in Adults- Diagnosis and Management Available at www.nice.org.uk/guidance/qs29 3. NICE Quality Standard 3 (2018V replaces 2010V) Venous thromboembolism in adults: reducing the risk in hospital. Available at www.nice.org.uk/guidance/qs3 4. NICE Guidance CG144 (March 2018replaces 2012) Venous thromboembolic disease and the role of thrombophilia testing.

	Available at www.nice.org.uk/guidance/cg144 5. NICE clinical guideline CG 138 (2012) Patient Experience in Adult NHS Services: Improving the Experience of Care for People Using Adult NHS Services. 6. NICE technology appraisal guidance 245 (2018 V replaces 2012) Apixaban for the prevention of venous thromboembolism after total hip or knee replacement in adults. Available at www.nice.org.uk/guidance/ta245 7. Apixaban for the treatment and secondary prevention of deep vein thrombosis and/or pulmonary embolism.(2017 V replaces 2015 V). Available at www.nice.org.uk/guidance/ta341 8. NICE technology appraisal guidance 170 (2018 V replaces 2009). Rivaroxaban for the prevention of venous thromboembolism after total hip or total knee replacement in adults.Available at www.nice.org.uk/guidance/ta170 9. NICE clinical guideline 76 (2009) Medicines adherence. 10. NICE technology appraisal guidance 157 (2018 V replaces 2008). Dabigatran for the prevention of venous thromboembolism after hip or knee replacement surgery in adults. Available at www.nice.org.uk/guidance/ta157 11. NICE technology appraisal guidance Dabigatran etexilate for the treatment and secondary prevention of deep vein thrombosis and/or pulmonary embolism (2017 V replaces2014 V) Available at www.nice.org.uk/guidance/ta327 12. NICE technology appraisal guidance (2018 V replaces July 2012). Rivaroxaban for the prevention and treatment of deep vein thrombosis and prevention of recurrent deep vein thrombosis and pulmonary embolism. Available at www.nice.org.uk/guidance/ta261 13. NICE technology appraisal guidance (2018 V replaces July 2012). Rivaroxaban for the prevention of venous thromboembolism after total hip or total knee replacement in adults (2018 V replaces 2009 V) Available at www.nice.org.uk/guidance/ta170 14. NICE technology appraisal guidance (2018 V replaces 2013). Rivaroxaban for treating pulmonary embolism and preventing recurrent venous thromboembolism. Available at www.nice.org.uk/guidance/ta287 15. NICE technology appraisal guidance 354(2017 V replaces 2015 V): Edoxaban for treating and for preventing deep vein thrombosis and pulmonary embolism. Available at www.nice.org.uk/guidance/ta354 16. NICE technology appraisal guidance (2018 V replaces 2014V) The geko device for reducing the risk of venous thromboembolism.Available at www.nice.org.uk/guidance/mtg19 17. ELHT Guideline for Prophylaxis for Venous Thromboembolism (VTE) in Children (< 16 years of age) 18. NICE guideline on care of dying adults in the last days of life NG31 Dec 2015.(Full NICE guidance can be accessed in the weblink here: https://www.nice.org.uk/guidance/ng31) 19. GMC guidance on prescribing unlicensed medicines accessible at GMC website on: https://www.gmc-uk.org/ethical-guidance/ethical-guidance-for-doctors/prescribing-and-managing-medicines-and-devices/prescribing-unlicensed-medicines

CONSULTATION		
	Committee/Group	**Date**
Consultation	Divisional Quality & Safety Committees	March 2019
Approval Committee	Venous Thrombo- Embolism (VTE) Committee &	18/03/2019
Ratification date at Policy Council:	March 2019	
NEXT REVIEW DATE:	March 2022	
AMENDMENTS:	1. The low molecular weight Heparin used in Trust for prophylaxis has been changed to Enoxaparin from late February 2019. New dosing regimen is included in this version. Please note Tinzaparin is still available as before for treatment dosing in management of suspected and confirmed VTE. 2. Updated version of all relevant NICE guidance reference sources included besides NICE Quality Statements on VTE Prophylaxis and Reducing Risk 3. VTE Risk Assessment Electronic Tool Details Added as implementation commences on 21/3/2019 and Training & Evaluation in wards currently in progress 4. Section on Thromboprophylaxis Pathway for patient with temporary lower limb immobilisation (cast or splint) for ED and Fracture Clinic updated to reflect switch to Enoxaparin 5. Amendments and updates in line with NICE guidance for prophylaxis for T&O and Trauma patients 6. Appendix for VTE prophylaxis for medical patients refers to section 10.3.1.3 on Acutely Ill medical patients 7. New appendix added to include GMC guidance on prescribing of unlicensed medications 8. Appendix 10 includes gov.uk guidance for all prescribers regarding unlicensed medicine prescribing available at: https://www.gov.uk/drug-safety-update/off-label-or-unlicensed-use-of-medicines-prescribers-responsibilities	

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Venous Thrombo- Embolism (VTE): Reducing Risk/ Prophylaxis

1 Introduction

An estimated 25,000 people in the UK die from preventable hospital-acquired venous thromboembolism (VTE) every year. Inconsistent use of prophylactic measures for VTE in hospital patients has been widely reported and a UK survey suggested that 71% of patients assessed to be at medium or high risk of developing deep vein thrombosis (DVT) did not receive any form of mechanical or pharmacological VTE prophylaxis. DVT occurs in more than 20% of patients having major surgery and more than 40% of patients having major orthopaedic surgery. It is commonly asymptomatic. However, the condition can lead to sudden death due to Pulmonary Embolism (PE), or cause long-term morbidity due to chronic venous insufficiency, venous ulceration and development of post-thrombotic syndrome (PTS). The estimated risk of fatal PE following high-risk surgery is said to be between 1 and 5%. Most commonly, postoperative PE occurs a few days to a week or two after operation, when recovery is well underway. Appropriate VTE risk assessment on admission to hospital and use of appropriate VTE prophylaxis can reduce this risk.

2 National Guidance

The recommendations in this guideline represent the updated NICE guidelines and NICE Quality statements besides relevant supporting internal Trust documents. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. The guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian. This guideline covers assessing and reducing the risk of venous thromboembolism (VTE or blood clots) and deep vein thrombosis (DVT) in people aged 16 and over in hospital. It aims to help healthcare professionals identify people most at risk and describes treatments and interventions that can be used to reduce the risk of VTE. This guideline is for all health care professionals and the scope of this guideline extends to all People aged 16 or over going into hospital who are at risk of VTE. This includes people aged 16 and over who are discharged from hospital, (including from A&E) with lower limb devices such as plaster casts and braces, people attending hospital for day procedures including cancer treatment and surgery, and pregnant women admitted to hospital or a midwife-led unit including up to 6 weeks after giving birth, and their carers. This policy outlines how patients who present to ELHT aged 16 and over are treated in respect of VTE prevention. For further reading of the full NICE guidance NG 89 that replaces earlier version of CG92 please visit www.nice.org.uk/guidance/ng89

3 Quality standards

- Statement 1 Medical, surgical or trauma patients have their risk of VTE and bleeding assessed using a national tool as soon as possible after admission to hospital.
- Statement 2 Patients who are at increased risk of VTE (and/or carers), are given information about VTE prevention on admission to hospital.
- Statement 3 Patients provided with anti-embolism stockings have them fitted and monitored in accordance with NICE guidance.
- Statement 4 Medical, surgical or trauma patients have their risk of VTE re-assessed at consultant review or if their clinical condition changes.
- Statement 5 Patients assessed to be at risk of VTE are offered VTE prophylaxis in accordance with NICE guidance.
- Statement 6 Patients/carers are offered verbal and written information on VTE prevention as part of the discharge process.

- Statement 7 Patients are offered extended (post hospital) VTE prophylaxis in accordance with NICE guidance**.**

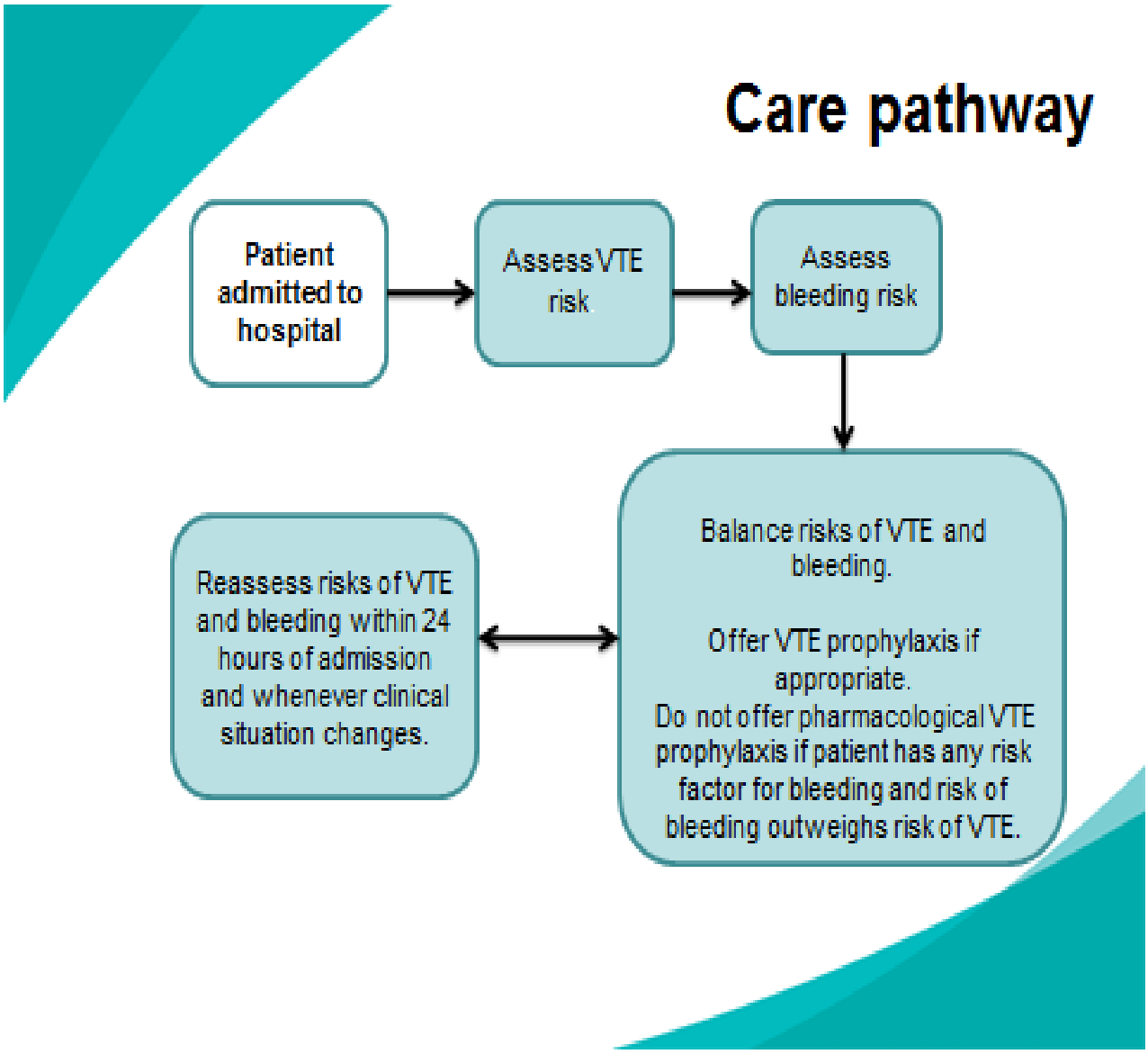
4 Key priorities for implementation for VTE prevention

Key priorities for implementation for VTE prevention are:

- Assessing and Reassessing the risks of VTE and Bleeding
- Reducing the risk of VTE through appropriate preventive strategies
- Patient Information to raise awareness and enhance patient involvement in care

5 Care pathway for VTE risk assessment

Care Pathway for VTE risk assessment recommended by National Institute of Clinical Excellence (NICE) is summarised under figure 1 below



There may be other surgical procedures requiring an inpatient stay that are not covered in this guideline. Healthcare professionals should exercise their clinical judgement when making decisions on the appropriateness of VTE prophylaxis.

6 Overview of Care Process

Table 1 below outlines the overview of care process to be followed in VTE risk reduction

Who	When	What
Patients having elective surgery/ procedure	Before Admission	• Advise women to consider stopping oestrogen-containing oral contraception or HRT 4 weeks before surgery. • Assess the risks and benefits of stopping antiplatelet therapy 1 week before surgery. • Plan anaesthesia.
All patients	At Admission/ following admission *	• Plan risk assessment(this should be documented in the appropriate risk assessment tool) • Assess risk of VTE at time of admission and re-assess again within 24 hours. • Assess risk of bleeding. • Offer patients verbal and written information on VTE (Trust VTE prevention Patient information leaflet available in OLI/Trust Intranet under VTE resources) • Offer VTE prophylaxis as appropriate. • If prophylaxis indicated ensure this is prescribed and administered in timely manner without delayed/missed doses.
All patients	During ward-based care as soon as possible after risk assessment	• Reassess risks of VTE and bleeding again within 24 hours. • Consultant review within 14 hours of admission for all in patients • Review VTE prophylaxis. • If prophylaxis indicated ensure this is prescribed and administered in timely manner without delayed/missed doses. • Monitor use of mechanical VTE prophylaxis. • Keep patients hydrated and encourage them to mobilise as soon as possible.
All patients	Before Discharge	• Offer information on signs and symptoms of DVT and PE and prevention. (Trust VTE prevention Patient information leaflet available in OLI/Trust Intranet under VTE resources) • Offer information on the importance of seeking medical help and who to contact if DVT, PE or other adverse event suspected.
Patients discharged with VTE prophylaxis	Before discharge	• Offer information on correct use and duration of VTE prophylaxis to be used at home and who to contact for help. • Ensure patients are able to use the VTE prophylaxis at home, or have someone available to help them. • Offer information on signs and symptoms of adverse events related to VTE prophylaxis and who to contact for help. • Highlight and reiterate advice and risks for those patients needing extended prophylaxis at home. • Inform GP that patient has been discharged with VTE prophylaxis.
Please note: This applies to all patients including those specified here in this row as well	Before and at initial review of patients and during care delivery and before patient is sent home	All the above care information and VTE preventive strategies apply for all Patients coming into hospital who are at risk of VTE. This includes people discharged from hospital, (including from A&E) with lower limb devices such as plaster casts and braces, people attending hospital for day procedures including cancer treatment and surgery, and pregnant women admitted to hospital or a midwife-led unit including up to 6 weeks after giving birth/or after miscarriage or termination, and their carers (NB: Pregnant women's care will need discussions with Obstetrician and also refer to Maternity services Guidelines on VTE prevention based on RCOG guidance).

*****Patients clinically suspected of having VTE who enter the pathway for investigation and management of suspected/actual VTE do not require this VTE risk assessment before entering the VTE diagnosis and Management pathway. **The procedure for obstetric patients is**

described separately (see *Maternity Services Clinical Guidelines:* Guideline 22: THROMBOPROPHYLAXIS)

7 Assessment of Risk of Developing VTE

Assess all patients as soon as possible after admission to hospital and again reassessed by the time of the first consultant review on admission (consultant review must take place within 14 hours of admission) and certainly within 24 hours of admission to identify those who are at increased risk of developing VTE. Risk of developing VTE is dependent upon a number of factors. These can be categorised as patient-related factors (common for all patients) and procedure-related factors (dependent upon the type of surgery being undertaken). Balance the person's individual risk of VTE against their risk of bleeding when deciding whether to offer pharmacological thromboprophylaxis to all patients. As risk may change patients must be reassessed within 24 hours of admission and whenever the clinical situation changes, to:

- ensure that appropriate methods of VTE prophylaxis are administered in a timely manner
- ensure that VTE prophylaxis is being used correctly
- Identify adverse events resulting from VTE prophylaxis.

Risk assessment is mandatory for all adult patients on admission to hospital apart from the following groups of patients identified as exceptions based on being within a defined low risk cohort as outlined in table 2 below. Case by case assessment of VTE risk by clinician is important in all cases with regards to clinical care and this is just guidance**.**

Table2: Patients identified as exceptions for VTE risk assessment

1. Haemodialysis
2. Endoscopy
3. Chemotherapy
4. Ophthalmological procedures with local anaesthetic/regional/ sedation and not full general anaesthetic
5. Non-cancer ENT surgery lasting less than 90 minutes with local anaesthetic/regional/sedation and not full general anaesthetic
6. Non-cancer plastic surgery lasting less than 90 minutes with local anaesthetic/regional/sedation and not full general anaesthetic
7. Non-cancer dental and maxillo-facial surgery lasting less than 90 minutes with local anaesthetic/regional/sedation and not full general anaesthetic
8. Other similar minor procedures lasting less than 90 minutes with local anaesthetic/regional/ sedation and not full general anaesthetic.
9. Day case procedures without admission for overnight stay in ward bed
10. Those admitted for terminal care or are commenced on end of life pathway

The risk assessment tool is included in Appendix 1 and a copy of this as standalone tool or as part of Risk Assessment tool contained within GAD is to be completed by admitting team for all eligible patients admitted to ELHT. The hard copy paper version ***will be replaced by an Electronic version of VTE risk assessment tool incorporated within Hospaedia system as part of Nursing assessments on admission (Trust wide implementation to commence 21/3/2019).*** Nursing and medical professionals should review VTE risk as part of admission process as well as subsequent ward rounds/review when repeat VTE risk assessment is indicated within 24 hours (usually expected to be repeated at time of consultant review within 14 hours) and ensure that appropriate VTE prophylaxis is prescribed and administered in a timely manner. Doctors should support nursing staff in timely completion of electronic risk assessment.

If risk assessment is completed in paper copy for any exceptional reasons even after roll out of electronic VTE tool (example: rare IT issues), the VTE risk must be documented in paper version and risk assessment filed in medical records and/or EPTS. This will not be applicable if VTE pathway for suspected VTE is used e.g. following attendance or planned admissions or via GP for suspected VTE - see part 2 of VTE guideline on management of VTE as this management will include risk management in itself through diagnostic and management pathway rather than a

prophylactic pathway. For elective admissions the risk must be assessed at pre-operative assessment visit and documented within Elective Admission Care Plan +/- electronic VTE risk assessment tool.

8 Documentation of VTE Risk Assessment

All patients admitted to hospital must have the VTE risk assessed in the electronic VTE risk assessment tool after it is implemented. Until then, for all emergency admissions the risk must be assessed at the time of admission and documented within the Generic Assessment Document (GAD) using risk assessment tool defined under appendix 2. For elective admissions the risk must be assessed at the pre-operative assessment visit and documented within the Elective Admission Care Plan/pathway. Once the VTE risk has been identified and documented, the speciality specific strategy of VTE prophylaxis must be followed. Any decision not to follow this must be discussed with consultant and documented clearly with reasons within the patient's medical records. ***This assessment of VTE risk must be repeated within 24 hours for all patients to identify if there is a change in clinical condition (ideally at the time of consultant review within 14 hours).***

9 General Advice on VTE Prevention

- Do not allow patients to become dehydrated unless clinically indicated
- Encourage patients to mobilise as soon as possible
- Arrange for immobilised patients to have leg exercises.
- Do not regard aspirin or other antiplatelet agents as adequate prophylaxis for VTE
- Consider offering temporary inferior vena caval filters to patients who are at very high risk of VTE (such as patients with a previous VTE event or an active malignancy) and for whom mechanical and pharmacological VTE prophylaxis are contraindicated.

For surgical patients

- **Vena caval filters** should be considered for surgical inpatients with recent (within 1 month) or existing VTE and in whom anticoagulation is contraindicated.
- The risks and benefits of stopping pre-existing established anticoagulation or antiplatelet therapy before surgery should be considered.(Please refer also to ELHT Guidelines on The Peri-Procedural Management of patients on Oral Anti-Coagulants & Anti Platelets V1 Feb 2017 available in OLI/Trust Intranet)
- Regional anaesthesia reduces the risk of VTE compared with general anaesthesia. Its suitability for an individual patient and procedure should be considered, along with the patient's preferences, in addition to any other planned method of VTE prophylaxis.
- If a regional anaesthetic technique is used, the timing of pharmacological prophylaxis should be carefully planned to minimise risk of haematoma.

10 Guidance on Use of Specific Methods to Prevent VTE

Healthcare professionals should as part of the admission and discharge plan, give patients and their family members or carers (as appropriate) verbal and written information on:

- the signs and symptoms of deep vein thrombosis (DVT) and pulmonary embolism
- how people can reduce their risk of VTE (such as keeping well hydrated and, if possible,
- exercising and becoming more mobile)
- the importance of seeking help if DVT, pulmonary embolism or other adverse events are suspected.

Give people discharged with VTE prophylaxis and their family members or carers (as appropriate) verbal and written information on:

- the importance of using VTE prophylaxis correctly (including the correct
- administration and disposal of pharmacological prophylaxis)
- the importance of continuing treatment for the recommended duration
- the signs and symptoms of adverse events related to VTE prophylaxis

- the importance of seeking help and who to contact if people have problems using VTE prophylaxis.

(Please refer to trust Patient Information Leaflet available on OLI /Trust Intranet)

Inform patients that the immobility associated with continuous travel of more than 3 hours in the 4 weeks before or after surgery may increase the risk of VTE.

Please see appendices 4-9 for specialty specific VTE prophylaxis guidance

10.1 TED Stockings

All patients in whom mechanical VTE prophylaxis is indicated should be offered graduated compression/anti-embolism stockings from the time of admission to hospital unless contraindicated.

10.1.1 Do not offer anti-embolism stockings to people who have:

- suspected or proven peripheral arterial disease
- peripheral arterial bypass grafting
- peripheral neuropathy or other causes of sensory impairment
- any local conditions in which anti-embolism stockings may cause damage – for
- example, fragile 'tissue paper' skin, dermatitis, gangrene or recent skin graft
- known allergy to material of manufacture
- severe leg oedema
- major limb deformity or unusual leg size or shape preventing correct fit.
- Use caution and clinical judgement when applying anti-embolism stockings over
- venous ulcers or wounds.
- Acute coronary syndromes: Be aware that people receiving anticoagulant drugs as part of their treatment for an acute coronary syndrome do not usually need VTE prophylaxis. (Please also see section 10.3.1.2)
- **A diagnosis of Acute Stroke.**

10.1.2 VTE Prophylaxis in Acute Stroke Patients

- There is minimal evidence of benefit in this group and they may promote skin necrosis and limb ischemia. Consider intermittent pneumatic compression device for VTE prophylaxis for people who are immobile and admitted with acute stroke. If using, start it within 3 days of acute stroke

- Explain to the person admitted with acute stroke and their family members or carers (as appropriate) that intermittent pneumatic compression: reduces the risk of DVT and may increase their chances of survival will not help them recover from stroke, and there may be an associated increased risk of surviving with severe disability.

- When using intermittent pneumatic compression for people who are admitted with acute stroke, provide it for 30 days or until the person is mobile or discharged, whichever is sooner.

10.1.3 Key care plan factors with Anti- embolism Stockings Use

- Ensure that people who need anti-embolism stockings have their legs measured and that they are provided with the correct size of stocking.
- Anti-embolism stockings should be fitted and patients shown how to use them by staff trained in their use.
- Ensure that people who develop oedema or postoperative swelling have their legs re-measured and anti-embolism stockings refitted.
- If arterial disease is suspected, seek expert opinion before fitting anti-embolism stockings.
- Use anti-embolism stockings that provide graduated compression and produce a calf pressure of 14–15 mmHg. (This relates to a pressure of 14–18 mmHg at the ankle and is

in line with British Standards BS 6612:1985 Specification for graduated compression hosiery and BS 7672:1993 Specification for compression, stiffness and labelling of anti-embolism hosiery.)

- Encourage people to wear their anti-embolism stockings day and night until they no longer have significantly reduced mobility.
- Remove anti-embolism stockings daily for hygiene purposes and to inspect skin condition.
- In people with a significant reduction in mobility, poor skin integrity or any sensory loss, inspect the skin 2 or 3 times a day, particularly over the heels and bony prominences.
- Monitor the use of anti-embolism stockings and offer assistance if they are not being worn correctly.
- Stop the use of anti-embolism stockings if there is marking, blistering or discolouration of the skin, particularly over the heels and bony prominences, or if the person experiences pain or discomfort. If suitable, offer intermittent pneumatic compression as an alternative.
- Do not offer intermittent pneumatic compression to people with a known allergy to the material of manufacture.
- Advise the person to wear their device for as much time as possible.
- If thigh-length stockings are inappropriate for a particular patient for reasons of compliance or fit, knee-length stockings may be used as a suitable alternative.
- In patients who are assessed at higher risk of falls, the gripped socks for falls prevention can be worn on top of the TED stockings to reduce this risk
- Ensure that people who are discharged with pharmacological and/or mechanical VTE prophylaxis are able to use it correctly, or have arrangements made for someone to be available who will be able to help them.
- **Notify the person's GP** if the person has been discharged with pharmacological and/or mechanical VTE prophylaxis to be used at home.

10.2 Intermittent pneumatic compression or foot impulse devices/GEKO device

- Stop the use of anti-embolism stockings if there is marking, blistering or discolouration of the skin, particularly over the heels and bony prominences, or if the person experiences pain or discomfort. If suitable, offer intermittent pneumatic compression as an alternative.
- Do not offer intermittent pneumatic compression to people with a known allergy to the material of manufacture.
- Advise the person to wear their device for as much time as possible.
- Intermittent pneumatic compression or foot impulse devices (in few selected cases with consultant input where choice has to be made between nil prophylaxis versus impulse devise) may be used as alternatives or in addition to graduated compression/anti-embolism stockings while patients are in hospital **(if indicated within specialty-specific guidance)**
- When used, intermittent pneumatic compression or foot impulse devices should be used for as much time as is possible and practical while patient is in bed or sitting in chair.
- These are single-patient use items and must not be re-used on other patients.
- They should be used until the patient has returned to normal levels of mobility
- The use of GEKO device was approved within Trust for use in small group of patients where other VTE prophylactic measures may be contra-indicated and to be used with consultant input
- Please refer to mechanical prophylaxis advise for acute stroke patients in page 10

10.3 Pharmacological prophylaxis VTE

Full guidance on the prescribing and availability of the following medicines is available via www.elmmb.nhs.uk. Pages 11-16 summarise the options of pharmacological prophylaxis available within our Trust. Pharmacological VTE prophylaxis MUST be prescribed and administered as soon as possible after risk assessment on admission provided there are nil contra indications.

NICE guidance NG 89 updated in March 2018 that directs the Trust policy replaced the earlier NICE clinical guidance and therefore supersedes that. The College of Emergency medicine have also published guidance for Trauma patients in 2013. Both NICE NG 89 and College of emergency Medicine Guideline recommend VTE prophylaxis in all patients aged 16 and above.
NICE acknowledged that at the time of publication of NG89 in March 2018, VTE prophylactic drugs did not have a UK marketing authorisation for use in young people under 18 for this indication. NICE recommendation states that for pharmacological VTE prophylaxis in people under 18, the NG89 should be followed in that the prescriber should follow relevant professional guidance, taking responsibility for the decision and Informed consent should be obtained and documented. Please see the General Medical Council's Prescribing guidance on 'Prescribing unlicensed medications' and 'Information for Patients regarding Unlicensed medications' for further information (Please refer to GMC website on: https://www.gmc-uk.org/ethical-guidance/ethical-guidance-for-doctors/prescribing-and-managing-medicines-and-devices/prescribing-unlicensed-medicines ***Also see appendix 8***). GMC guidance recommends that the professional should ensure that patient fulfils criteria for VTE prophylaxis through appropriate risk assessment, ensure there are nil contra indications, discuss NICE guidance recommendation with patient, state it is unlicensed in this age group (16-18) and clarify that National NICE guidance recommends VTE prophylaxis in this age group before seeking and documenting informed consent from patient in medical records.

10.3.1 Pharmacological prophylaxis for different group of patients

10.3.1.1. People using antiplatelet agents

Consider VTE prophylaxis for people who are having antiplatelet agents for other conditions and whose risk of VTE outweighs their risk of bleeding. Take into account the risk of bleeding and of comorbidities such as arterial thrombosis. If the risk of VTE outweighs the risk of bleeding, consider pharmacological VTE prophylaxis based on their condition or procedure. If the risk of bleeding outweighs the risk of VTE, consider mechanical VTE prophylaxis.

10.3.1.2 In people using anticoagulation therapy

Consider VTE prophylaxis for people at increased risk of VTE who are interrupting anticoagulant therapy. (Please refer to Trust guidance: The Peri-Procedural Management of patients on Oral Anti-Coagulants & Anti Platelets V2 March 2018 and ELHT Oral Anticoagulation Guidelines available in OLI/Trust Intranet

10.3.1.3: Acutely ill medical patients

Offer pharmacological VTE prophylaxis for a minimum of 7 days to acutely ill medical patients whose risk of VTE outweighs their risk of bleeding: Use LMWH as first-line treatment. If LMWH is contraindicated, use fondaparinux sodium.

10.3.1.4: Interventions for people with renal impairment

If using pharmacological VTE prophylaxis for people with renal impairment, choose either LMWH or unfractionated heparin (UFH). If needed, reduce the dose of LMWH and UFH for people with renal impairment. Base the decision on multidisciplinary or senior opinion, or locally agreed protocols (Please refer to section 10.3.2 on LMWH dosing, contra indications and Monitoring requirements)

10.3.1.4: VTE prophylaxis Interventions for people with cancer

- Do not offer VTE prophylaxis to people with cancer who are receiving cancer modifying treatments such as radiotherapy, chemotherapy or immunotherapy and who are mobile, unless they are also at increased risk of VTE because of something other than the cancer.
- Consider pharmacological VTE prophylaxis for people with myeloma who are receiving chemotherapy with thalidomide, pomalidomide or lenalidomide with steroids. Choose either aspirin (75 or 150mg) or LMWH

- Consider pharmacological VTE prophylaxis with LMWH for people with pancreatic cancer who are receiving chemotherapy. If giving VTE prophylaxis to people with cancer continue for as long as they are receiving chemotherapy.

10.3.1.5: VTE prophylaxis interventions for People having Palliative care

- Consider pharmacological VTE prophylaxis for people who are having palliative care.
- Take into account temporary increases in thrombotic risk factors, risk of bleeding, likely life expectancy and the views of the person and their family members or carers (as appropriate):
- Use LMWH as first-line treatment.
- If LMWH is contraindicated, use fondaparinux sodium
- Do not offer VTE prophylaxis to people in the last days of life.
- For recommendations on shared decision-making in the last days of life, see the
- NICE guideline on care of dying adults in the last days of life.(Full NICE guidance can be accessed in the weblink here: https://www.nice.org.uk/guidance/ng31)
- Review VTE prophylaxis daily for people who are having palliative care, taking into account the views of the person, their family members or carers (as appropriate) and the multidisciplinary team.

10.3.1.6: VTE Prophylaxis Interventions for people admitted to critical care

- Assess all people admitted to the critical care unit for risk of VTE and bleeding.
- Provide LMWH to people admitted to the critical care unit if pharmacological VTE prophylaxis is not contraindicated.
- For people with renal impairment, please refer to section 10.3.2.3)
- Consider mechanical VTE prophylaxis (Intermittent pneumatic compression or foot impulse devices/GEKO device and/or TED stockings) for people admitted to the critical care unit if pharmacological prophylaxis is contraindicated based on their condition or procedure.
- If using mechanical VTE prophylaxis for people admitted to the critical care unit, start it on admission and continue until the person no longer has reduced mobility relative to their normal or anticipated mobility.
- Reassess VTE and bleeding risk daily for people in critical care units.
- Assess VTE and bleeding risk more than once a day in people admitted to the critical care unit if the person's condition is changing rapidly.

10.3.1.7: VTE Prophylaxis Interventions for people with psychiatric illness

- Assess all acute psychiatric patients to identify their risk of VTE and bleeding as soon as possible after admission to hospital or by the time of the first consultant review
- Reassess all people admitted to an acute psychiatric ward for risk of VTE and bleeding at the point of consultant review or if their clinical condition changes.
- Consider pharmacological VTE prophylaxis with LMWH for people admitted to an acute psychiatric ward whose risk of VTE outweighs their risk of bleeding.
- Consider pharmacological VTE prophylaxis with fondaparinux sodium if LMWH is contraindicated for people admitted to an acute psychiatric ward whose risk of VTE outweighs their risk of bleeding.
- Continue pharmacological VTE prophylaxis for people admitted to an acute psychiatric ward until the person is no longer at increased risk of VTE.

10.3.1.8: VTE prophylaxis Interventions when using anaesthesia

- Consider regional anaesthesia for individual patients, in addition to other methods of VTE prophylaxis, as it carries a lower risk of VTE than general anaesthesia.
- Take into account the person's preferences, their suitability for regional anaesthesia and any other planned method of VTE prophylaxis

- If regional anaesthesia is used, plan the timing of pharmacological VTE prophylaxis to minimise the risk of epidural haematoma.
- If antiplatelet or anticoagulant agents are being used, or their use is planned, refer to the summary of product characteristics for guidance about the safety and timing of these in relation to the use of regional anaesthesia.
- Do not routinely offer pharmacological or mechanical VTE prophylaxis to people undergoing a surgical procedure with local anaesthesia by local infiltration with no limitation of mobility.

10.3.1.9: VTE prophylaxis Interventions for people with Renal Impairment:

- This includes people with an estimated glomerular filtration rate (eGFR) of less than 30 ml/min/1.73m2.
- If using pharmacological VTE prophylaxis for people with renal impairment, choose either LMWH or unfractionated heparin (UFH).
- If needed, reduce the dose of LMWH[4] and UFH for people with renal impairment. Base the decision on multidisciplinary or senior opinion, or locally agreed protocols.

10.3.2 Heparin Dosing Regimen, Contra Indications & Monitoring Requirements

10.3.2.1. Low Molecular Weight Heparin:

The low molecular weight heparin (LMWH) used for VTE prophylaxis within the Trust is Enoxaparin. The 10,000 international units per mL preparation of Enoxaparin is used in prophylaxis (100mg/1mL). Unfractionated Heparin is also available for patients with persisting renal impairment with creatinine clearance below 15 mL/minute.

10.3.2.2. Enoxaparin Dosing Regimen:

Dosing is as per the product license for medical and surgical prophylaxis and additional expert advice from other organisations. Please refer to separate local Maternity Services Guidelines G22 on thrombo-prophylaxis dosing relating to pregnancy, pre and post-delivery.

Medical and Surgical patients at high risk for VTE as per VTE risk assessment	**STANDARD DOSE**	**RENAL DOSE** ***(Creatinine clearance <30mL/min)***
Patient weight <50kg	**Enoxaparin 20mg once daily**	Enoxaparin 20mg once daily
Patient weight 50 to 120kg	**Enoxaparin 40mg once daily***	Enoxaparin 20mg once daily
Patient weight >120 to150kg	**Enoxaparin 40mg Twice daily**	Enoxaparin 40mg once daily
Patient weight >150kg	**Enoxaparin 60mg Twice daily**	Enoxaparin 40mg once daily
NB *Actual* body weight should be used for dose calculation		
Patients at moderate risk of VTE The ELHT VTE Risk Assessment tool identifies patients at high risk of VTE requiring pharmacological thromboprophylaxis at a dose of enoxaparin 40mg once daily. * However, a lower dose of 20mg once daily enoxaparin may be considered in surgical patients at moderate risk of VTE at the consultant's discretion.		

The drug is given subcutaneously depending upon time of admission, nature of surgery, type of anaesthesia and other patient factors usually at 6pm if on once daily regimen or as recommended by consultant. Doses must be prescribed as units and dose volume in mL, and state the indication

as PROPHYLAXIS on the prescription chart. Patient's weight must always be recorded on the prescription chart.

10.3.2.3. Renal Impairment

Local practice is to maintain standard dosing with enoxaparin during short term Acute Kidney Injury (AKI). With respect to Chronic Kidney Impairment or persisting Acute Kidney Injury it is suggested that enoxaparin 20mg once a day is acceptable below 15mL/min although this is unlicensed. Experience in other centres is that bleeding events in this scenario are extremely rare. Clinicians may choose to use unfractionated heparin if risk of bleeding is a particular concern, though this antithrombotic is much more complex in terms of administration and monitoring and this decision should be made at consultant level.
Monitoring of anti-factor Xa activity ***may be*** considered in patients with ***severe*** renal impairment (though this is a poor predictor for haemorrhage, and is not recommended locally as a routine for those on prophylactic dosing).

10.3.2.4. Contraindications to Enoxaparin:

- Recent thrombotic stroke
- Acute bacterial endocarditis
- Active major bleeding including recent haemorrhagic stroke or baseline INR > 1.5 – seek advice
- Uncontrolled systolic hypertension (230/120 mmHg or higher)
- Untreated inherited bleeding disorders (such as haemophilia and von Willebrand's
- disease)
- Acquired bleeding disorders (such as acute liver failure)
- Thrombocytopenia in patients with positive in vitro aggregation test in the presence of enoxaparin (heparin induced thrombocytopenia-HIT)
- Active gastric or duodenal ulceration
- Hypersensitivity to either enoxaparin sodium, heparin or its derivatives- including other LMWHs
- Platelet count less than 75 x 10^9/L (if platelets below this level, contact haematology)
- Patients who are receiving therapeutic anticoagulation e.g. DOACs, warfarin
- Thrombocytopenia (platelets < 75 x 10^9/L)
- Oesophageal varices
- Recent neurosurgery/eye surgery (ear surgery – seek advice)
- Patients with ruptured cranial or spinal vascular malformations (for example intra-cranial aneurysms) should not be offered pharmacological prophylaxis until lesion has been secured

Periods for avoiding peri-operative dosing

- Lumbar puncture/epidural/spinal anaesthesia expected within the next 12 hours
- Lumbar puncture/epidural/spinal anaesthesia within the previous 4 hours

10.3.2.5. Monitoring Requirements for LMWH or unfractionated heparin:

- Heparin Induced thrombocytopenia (HIT) is a possible complication of treatment with heparins. The immune-mediated type usually occurs 7-11 days (up to 20 days) after initiating treatment. Monitoring platelet count is therefore recommended.
- Patients who are to receive any type of heparin require a baseline platelet count on the day of starting treatment. Enoxaparin is contra-indicated where platelet count is <75 x 10^9L
- Patients exposed to heparin in the last 100 days should have a baseline platelet count and another check 24 hours after starting heparin. No further monitoring is required during or following treatment unless clinically indicated (e.g. following cardiopulmonary bypass)
- If the platelet count falls by 30% or more or the patient develops new thrombosis or skin allergy or any other of the rarer manifestations of HIT between day 4 and 14 consider a

diagnosis of Heparin induced thrombocytopenia and discuss with a haematologist ***URGENTLY***.

- There is NO need to monitor the anticoagulant activity of Enoxaparin (e.g INR or APTT) when used for VTE prophylaxis.

10.3.2.6. Precautions with Epidural Catheters, Spinal Anaesthesia and Lumbar Puncture for concurrent prophylactic LMWH:

Insertion/removal of an epidural catheter or performance of a lumbar puncture should be delayed for12 hours after LMWH administration unless the benefit of insertion/removal of the catheter is felt to outweigh the risk of epidural haematoma, is discussed with the patient and consultant anaesthetist, and recorded clearly in the medical notes. Dosing with LMWH should be delayed for 4 hours after any such procedure above.

Note: Be aware that although heparins are of animal origin, they undergo significant chemical modification but yet may be of concern to some people. Discuss the alternatives with people who have concerns about using animal products, after discussing their suitability, advantages and disadvantages with the person. Consider alternatives to Enoxaparin in these instances Example: Fondaparinux

10.3.3. Other pharmacological methods for prevention of VTE

Both Rivaroxaban, Apixaban and Dabigatran Etexilate are approved for use as recommended options for VTE prophylaxis after total Knee/Hip replacement surgery. Please see appendices 3-8 for specialty specific guidance and refer to full NICE guidance on link,below:http://www.nice.org.uk/guidance/ta157/resources/dabigatran-etexilate-for-the-prevention-of-venous-thromboembolism-after-hip-or-knee-replacement-surgery-in-adults-82598319782341

10.3.3.1. Warfarin

Warfarin is not indicated for routine prophylaxis of VTE. Any patient on warfarin presenting for surgery should have their anticoagulation regimen discussed with a consultant haematologist.
Please refer to ELHT Oral Anticoagulation Guidelines (warfarin / vitamin K antagonists) for further details on this as well as for details on bridging therapy pre-operatively.

10.3.3.2. Fondaparinux

The synthetic pentasaccharide fondaparinux, is a highly selective, indirect inhibitor of factor Xa. It is licensed for use in VTE prophylaxis in medical patients, and in patients undergoing major lower limb orthopaedic surgery or abdominal surgery. It should be used with caution in patients with renal impairment. Fondaparinux administered postoperatively, was at least as effective as a LMWH at reducing the risk of VTE in patients undergoing High risk abdominal surgery, with comparable rates of major bleeding. The usual dose is 2.5 mg for VTE prophylaxis administered subcutaneously as a once daily regimen. For patients who may prefer alternatives to LMWH due to animal nature of origin, Fondaparinux or one of the novel/direct oral anticoagulants (DOACs) may be an alternative option to consider, based on clinical judgement after discussing their suitability, advantages and disadvantages with the patient. (Please note: DOACs or Fondaparinux are not recommended in those with active cancer. ***Please refer to Appendix 2 for details on NOACS***)

11 Giving Information to Patients/Carers and Planning for Discharge

11.1. On admission ensure that people understand the reason for having a risk assessment for VTE and bleeding.

11.2. For people admitted to hospital who are at increased risk of VTE, give them and their family members or carers (as appropriate) verbal and written information on the following before offering VTE prophylaxis:

- the person's risks and possible consequences of VTE

- the importance of VTE prophylaxis and its possible side effects – for example, pharmacological prophylaxis can increase bleeding risk
- the correct use of VTE prophylaxis – for example, anti-embolism stockings, intermittent pneumatic compression
- how people can reduce their risk of VTE (such as keeping well hydrated and, if possible, exercising and becoming more mobile).

11.3. Be aware that although heparins are of animal origin, they undergo significant chemical modification but yet may be of concern to some people. Discuss the alternatives with people who have concerns about using animal products, after discussing their suitability, advantages and disadvantages with the person. Consider alternatives to Enoxaparin in these instances Example: Fondaparinux

11.4. As part of the discharge plan, give patients and their family members or carers (as appropriate) verbal and written information on:
- the signs and symptoms of deep vein thrombosis (DVT) and pulmonary embolism
- how people can reduce their risk of VTE (such as keeping well hydrated and, if possible, exercising and becoming more mobile)
- the importance of seeking help if DVT, pulmonary embolism or other adverse events are suspected.

11.5. Give people discharged with VTE prophylaxis and their family members or carers (as appropriate) verbal and written information on:
- the importance of using VTE prophylaxis correctly (including the correct administration and disposal of pharmacological prophylaxis)
- the importance of continuing treatment for the recommended duration
- the signs and symptoms of adverse events related to VTE prophylaxis
- the importance of seeking help and who to contact if people have problems using VTE prophylaxis.

11.6. Ensure that people who are discharged with anti-embolism stockings:
- understand the benefits of wearing them
- understand the importance of wearing them correctly
- understand the need to remove them daily for hygiene purposes
- are able to remove and replace them, or have someone available who will be able to do this for them
- know what to look for if there is a problem – for example, skin marking, blistering or discolouration, particularly over the heels and bony prominences
- know who to contact if there is a problem
- know when to stop wearing them.

11.7. Ensure that people who are discharged with pharmacological and/or mechanical VTE prophylaxis
- are able to use it correctly, or have arrangements made for someone to be available who will be able to help them.
- Are given clear documented instructions on how long to continue prophylaxis and when to stop
- Are prescribed the full course of pharmacological prophylaxis for the entire duration for which it is advised and recommended including those requiring extended VTE prophylaxis
- Notify the person's GP if the person has been discharged with pharmacological and/or mechanical VTE prophylaxis to be used at home with clear instructions regarding any monitoring advise if/as appropriate and the duration for which the prophylaxis has been advised/recommended.

- Please refer to East Lancashire Best Practice Guideline on use of LMWH and prescribing which can be accessed through OLI

12 Training

As a minimum VTE risk assessment, principles of VTE risk reduction and prophylaxis are included within Core Mandatory Training for staff. All staff are expected to update this training on an annual basis and complete the self-declaration statements on completion of the VTE learning. Information is also available on the Trust Intranet site: http://oli.xelht.nhs.uk/sorce/beacon/?pageid=VTE

13 Monitoring Compliance with this guideline

All Divisions & Directorates are committed to ensure compliance with this evidence based Trust guideline based on National/NICE guidance. Leadership accountability, Roles and responsibilities within Divisions & Directorates are to be locally agreed through the respective Quality & Safety Committees which are also to monitor the reporting arrangements and provide assurance to the Trust Patient Safety & Risk Assurance committee (PSRA) through the VTE committee (which functions as a sub –committee of the PSRA). Please refer to ***appendix 3*** for further details on how compliance to this guideline will be monitored.

Appendix 1: RISK ASSESSMENT FOR VENOUS THROMBOEMBOLISM

TO BE COMPLETED IN ALL PATIENTS ON ADMISSION & TO BE REPEATED AGAIN WITHIN 24 HOURS OF ADMISSION & TO BE REPEATED WHENEVER CLINICAL CONDITION CHANGES. **Electronic VTE risk assessment will be implemented Trust wide from 21/3/2019 for daily risk review**

STEP 1					
Mobility - all patients (tick one box)	**Tick**		**Tick**		**Tick**
Surgical patient		Medical or obstetric patient expected to have ongoing reduced mobility relative to normal state		Medical or obstetric patient NOT expected to have significantly reduced mobility relative to normal state	
Assess for thrombosis and bleeding risk below				**Risk assessment now complete**	

STEP 2			
Thrombosis Risk			
Patient related	**Tick**	**Admission related**	**Tick**
Active cancer or cancer treatment		Significantly reduced mobility for 3 days or more	
Age > 60		Hip or knee replacement	
Dehydration		Hip fracture	
Known thrombophilias		Total anaesthetic + surgical time > 90 minutes	
Obesity (BMI >30 kg/m²)		Surgery involving pelvis or lower limb with a total anaesthetic + surgical time > 60 minutes	
One or more significant medical comorbidities (eg heart disease; metabolic, endocrine or respiratory pathologies; acute infectious diseases; inflammatory conditions)		Acute surgical admission with inflammatory or intra-abdominal condition	
Personal history of first-degree relative with a history of VTE		Critical care admission	
Use of hormone replacement therapy / OCP		Surgery with significant reduction in mobility	
Use of oestrogen-containing contraceptive therapy			
Varicose veins with phlebitis			
Pregnancy or « 6 weeks post partum (see NICE guidance for specific risk factors)			

STEP 3			
Bleeding Risk			
Patient related	**Tick**	**Admission related**	**Tick**
Active bleeding		Neurosurgery, spinal surgery or eye surgery	
Acquired bleeding disorders (such as acute liver failure)		Other procedure with high bleeding risk	
Concurrent use of anticoagulants known to increase the risk of bleeding (such as warfarin with (INR >2)		Lumbar puncture / epidural / spinal anaesthesia expected within the next 12 hours	
Acute stroke (within last month)		Lumbar puncture / epidural / spinal anaesthesia within the previous 4 hours	
Thrombocytopaenia (platelets« 75x10⁹/l)			
Uncontrolled systolic hypertension (230/120 mmHg or higher)			
Untreated inherited bleeding disorders (such as haemophilia and von Willebrand's disease)			

Date & Time	Level of VTE Risk (High / Low)	Bleeding Risk (Yes / No)	Pharmacological prophylaxis contra-indicated? (Yes / No)	Signature of Assessor & Designation

See details of stepwise approach to be followed in all in-patients in next page

Appendix 1 - Continued ***Same principles apply in VTE electronic tool risk assessment***

STEP ONE

- Assess patient for change in mobility status.
- If the patient is to undergo surgery proceed to step 2.
- If the patient is non-surgical and not expected to have an activity level that is reduced from the normal state then no further assessment is required.
- If activity level is expected to be reduced in non-surgical patient then proceed to step 2.
-

STEP TWO

- Review the patient-related factors shown on the assessment sheet against thrombosis risk, ticking each box that applies (more than one box can be ticked).
- Any tick for thrombosis risk should prompt VTE prophylaxis according to local policy.
- The risk factors identified are not exhaustive.
- Clinicians may consider additional risks in individual patients and offer VTE prophylaxis as appropriate.
- Review the patient-related factors shown against bleeding risk and tick each box that applies (more than one box can be ticked).
- Any tick for bleeding risk should prompt clinical staff to consider if bleeding risk is sufficient to preclude pharmacological intervention.

STEP THREE

- Complete the details of VTE risk assessment in box with date& signature.
- If form has been filled correctly and no boxes are ticked, then patient is at low risk of VTE and no intervention indicated.
- All MUST have VTE risk assessment repeated within 24 hours of admission
- All MUST have VTE risk assessment repeated whenever there is a change in clinical condition.
- Risk assessment MUST be completed on admission as soon as possible.
- Start pharmacological VTE prophylaxis as soon as possible after risk assessment.
- Electronic VTE risk assessment tool enables daily VTE risk review & added benefit

Note: Must discuss with consultant regarding patients assessed to be at high risk of VTE who are also at high risk of bleeding and/or if VTE prophylaxis is contraindicated and ensure this is clearly documented in case notes with reasons for not prescribing prophylaxis

Appendix 2: Direct Oral Anti-Coagulants (DOACs)

For patients who may prefer alternatives to LMWH due to animal nature of origin, Fondaparinux or one of the direct oral anticoagulants (DOACs) may be an alternative option to consider, based on clinical judgement after discussing their suitability, advantages and disadvantages with the patient. (Please note: DOACs or Fondaparinux are not recommended in those with active cancer). For full details on the relevant DOAC, please refer to the full NICE technology guidance on each DOAC as referred to in the supporting references section of this policy document in pages 2 and 3 as below.

- NICE technology appraisal guidance 245 (2018 V replaces 2012) Apixaban for the prevention of venous thromboembolism after total hip or knee replacement in adults. Available at www.nice.org.uk/guidance/ta245

- Apixaban for the treatment and secondary prevention of deep vein thrombosis and/or pulmonary embolism.(2017 V replaces 2015 V). Available at www.nice.org.uk/guidance/ta341

- NICE technology appraisal guidance 170 (2018 V replaces 2009). Rivaroxaban for the prevention of venous thromboembolism after total hip or total knee replacement in adults.Available at www.nice.org.uk/guidance/ta170

- NICE technology appraisal guidance 157 (2018 V replaces 2008). Dabigatran for the prevention of venous thromboembolism after hip or knee replacement surgery in adults. Available at www.nice.org.uk/guidance/ta157

- NICE technology appraisal guidance Dabigatran etexilate for the treatment and secondary prevention of deep vein thrombosis and/or pulmonary embolism (2017 V replaces2014 V) Available at www.nice.org.uk/guidance/ta327

- NICE technology appraisal guidance (2018 V replaces July 2012). Rivaroxaban for the prevention and treatment of deep vein thrombosis and prevention of recurrent deep vein thrombosis and pulmonary embolism. Available at www.nice.org.uk/guidance/ta261

- NICE technology appraisal guidance (2018 V replaces July 2012). Rivaroxaban for the prevention of venous thromboembolism after total hip or total knee replacement in adults (2018 V replaces 2009 V) Available at www.nice.org.uk/guidance/ta170

- NICE technology appraisal guidance (2018 V replaces 2013). Rivaroxaban for treating pulmonary embolism and preventing recurrent venous thromboembolism. Available at www.nice.org.uk/guidance/ta287

- NICE technology appraisal guidance 354(2017 V replaces 2015 V): Edoxaban for treating and for preventing deep vein thrombosis and pulmonary embolism. Available at www.nice.org.uk/guidance/ta354

Appendix 3: Monitoring compliance with Guideline

	How	When	Where reported
a. How patients are assessed for their risk of developing VTE including timescales	UNIFY submission of monthly number of inpatients admitted in month who have been risk assessed for VTE using the national tool within policy timescale	Each month	Submission to UNIFY monthly Bi-monthly reports to Patient Safety & Risk Assurance Committee Bi-monthly reports from Divisions to VTE committee
	An audit reporting the policy requirements (reflecting NICE guidance) of a specific number of admissions for a specific timeframe. Audit to include no less than 100 admissions	Reporting Bi-annually	Patient Safety & Risk Assurance Committee Through VTE Committee
b. Prophylactic regime for High Risk Patients	An audit reporting the policy requirements (reflecting NICE guidance) of a specific number of admissions for a specific timeframe. Audit to include no less than 100 admissions	Reporting Bi-annually	Patient Safety & Risk Assurance Committee Through VTE Committee
c. Procedure to be followed if VTE suspected	An audit following review of at least 30 patients where VTE is suspected and VTE is confirmed for specified time frame.	Reporting Bi-annually	Patient Safety & Risk Assurance Committee Through VTE Committee
d. How the organisation Trains staff in line with the training needs analysis.	See Audit for HR42		

Appendix 4: VTE Prophylaxis Interventions for People Having Orthopaedic Surgery

1. Interventions for people having orthopaedic surgery

1.1 Lower limb immobilisation (Includes patients managed with plaster casts/similar)

- Consider pharmacological VTE prophylaxis with LMWH or Fondaparinux Sodium or UFH for patients with severe renal impairment or established renal failure *for* people with lower limb immobilisation (this includes patients with lower limb fractures managed with plaster casts) whose risk of VTE outweighs their risk of bleeding
- Continue VTE prophylaxis until normal mobility is restored or until lower limb plaster cast removal.
- Consider stopping prophylaxis if lower limb immobilisation continues beyond 42 days depending on individual patient risk assessment and discussions with patient/family/carers with appropriate clear documentation in medical records.
- The term lower limb immobilisation as per NICE refers to any clinical decision taken to manage the affected limb in a way that would prevent normal weight bearing status or use of that limb, or both.
- All patients need to be given advice about early mobilisation as safely permissible, maintenance of hydration and the signs of DVT/PE and provided with ELHT Patient information leaflet on VTE prevention.

Please also see appendix 5 outlining the VTE Prevention Pathways for management of patients with lower limb fractures managed with plaster cats/similar in Emergency Department and fracture clinics

1.2 Fragility fractures of the pelvis, hip and proximal femur

- Offer VTE prophylaxis ***for a month*** to people with fragility fractures of the pelvis, hip or proximal femur if the risk of VTE outweighs the risk of bleeding.
- Choose either: LMWH, starting 6–12 hours after surgery or fondaparinux sodium, starting 6 hours after surgery, providing there is low risk of bleeding.
- Consider pre-operative VTE prophylaxis for people with fragility fractures of the pelvis, hip or proximal femur ***if surgery is delayed beyond the day after admission***. Give the last dose no less than 12 hours before surgery for LMWH or 24 hours before surgery for fondaparinux sodium.
- Consider intermittent pneumatic compression for people with fragility fractures of the pelvis, hip or proximal femur at the time of admission if pharmacological prophylaxis is contraindicated.
- UFH (for patients with severe renal impairment or established renal failure),starting at admission, stopping 12 hours before surgery and restarting 6–12 hours after surgery.
- Continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.
- The total amount of prophylaxis required should be supplied by the hospital on discharge to complete the course and the patient issued with appropriate written (Provide ELHT Patient Information leaflet on VTE prevention) and verbal advice.

1.3 Elective hip replacement (including revision surgery)

- Offer VTE prophylaxis to people undergoing elective hip replacement surgery whose risk of VTE outweighs their risk of bleeding. Choose any one of:
- LMWH for 10 days followed by aspirin (75 or 150 mg) for a further 28 days.
- LMWH for 28 days combined with anti-embolism stockings (until discharge).
- Rivaroxaban, within its marketing authorisation, is recommended as an option for the prevention of venous thromboembolism in adults having elective total hip replacement

surgery or elective total knee replacement surgery. Please refer to NICE technology appraisal guidance 170 (2018 V replaces 2009). Rivaroxaban for the prevention of venous thromboembolism after total hip or total knee replacement in adults.Available at www.nice.org.uk/guidance/ta170

- Consider one of the following if none of the options can be used:

➢ Apixaban is recommended as an option for the prevention of venous thromboembolism in adults after elective hip or knee replacement surgery. Please refer to NICE technology appraisal guidance 245 (2018 V replaces 2012) Apixaban for the prevention of venous thromboembolism after total hip or knee replacement in adults. Available at www.nice.org.uk/guidance/ta245

➢ Dabigatran etexilate, within its marketing authorisation, is recommended as an option for the primary prevention of venous thromboembolic events in adults who have undergone elective total hip replacement surgery or elective total knee replacement surgery. Please refer to NICE technology appraisal guidance 157 (2018 V replaces 2008). Dabigatran for the prevention of venous thromboembolism after hip or knee replacement surgery in adults. Available at www.nice.org.uk/guidance/ta157

➢ Consider anti-embolism stockings until discharge from hospital if pharmacological interventions are contraindicated in people undergoing elective hip replacement surgery.

At admission: Offer mechanical VTE prophylaxis with any one of: anti-embolism stockings (thigh or knee length), used with caution, foot impulse devices, intermittent pneumatic compression devices (thigh or knee length). Continue until patient's mobility is no longer significantly reduced.

2. Management after surgery:

2.1 Total Hip Replacement

Calf Compression/mechanical prophylaxis ***plus*** pharmacological prophylaxis as follows with Enoxaparin or suitable alternatives

Enoxaparin VTE Prophylaxis Dosing Regimen:

Dosing is as per the product license for medical and surgical prophylaxis and additional expert advice from other organisations. Please refer to separate local Maternity Services Guidelines G22 on thrombo-prophylaxis dosing relating to pregnancy, pre and post-delivery.

Medical and Surgical patients at high risk for VTE as per VTE risk assessment	**STANDARD DOSE**	RENAL DOSE in Chronic Kidney Disease (Creatinine clearance <30mL/min)
Patient weight <50kg	**Enoxaparin 20mg once daily**	Enoxaparin 20mg once daily
Patient weight 50 to 120kg	**Enoxaparin 40mg once daily***	Enoxaparin 20mg once daily
Patient weight >120 to150kg	**Enoxaparin 40mg Twice daily**	Enoxaparin 40mg once daily
Patient weight >150kg	**Enoxaparin 60mg Twice daily**	Enoxaparin 40mg once daily
NB *Actual* body weight should be used for dose calculation		
Patients at moderate risk of VTE The ELHT VTE Risk Assessment tool identifies patients at high risk of VTE requiring pharmacological thromboprophylaxis at a dose of enoxaparin 40mg once daily. * However, a lower dose of 20mg once daily enoxaparin may be considered in surgical patients at moderate risk of VTE at the consultant's discretion.		

The drug is given subcutaneously depending upon time of admission, nature of surgery, type of anaesthesia and other patient factors usually at 6pm if on once daily regimen or as recommended by consultant. Doses must be prescribed as units and dose volume in mL, and state the indication as PROPHYLAXIS on the prescription chart. Patient's weight must always be recorded on the prescription chart.

(For further details on dosing and exceptions, see page 9 of Trust VTE Prophylaxis policy)
LMWH starting 6–12 hours after surgery as per current NICE recommendations
LMWH prophylaxis should be continued for 28-35 days after surgery.
The total amount of prophylaxis required should be supplied by the hospital on discharge to complete the course and the patient issued with appropriate written and verbal advice
TED stockings are not required

2.2 Elective knee replacement

- **Offer VTE prophylaxis to people undergoing elective knee replacement surgery whose VTE risk outweighs their risk of bleeding. Choose any one of:**

- Aspirin(75 or 150 mg) for 14 days.

- LMWH for 14 days combined with anti-embolism stockings until discharge.

- Rivaroxaban within its marketing authorisation, is recommended as an option for theprevention of venous thromboembolism in adults having elective total hip replacement surgery or elective total knee replacement surgery. Please refer to NICE technology appraisal guidance (2018 V replaces July 2012). Rivaroxaban for the prevention of venous thromboembolism after total hip or total knee replacement in adults (2018 V replaces 2009 V) Available at www.nice.org.uk/guidance/ta170

- **Consider one of the following if none of the options above can be used:**

- Apixaban is recommended as an option for the prevention of venous thromboembolism in adults after elective hip or knee replacement surgery. Please refer to NICE technology appraisal guidance 245 (2018 V replaces 2012) Apixaban for the prevention of venous thromboembolism after total hip or knee replacement in adults. Available at www.nice.org.uk/guidance/ta245

- Dabigatran etexilate, within its marketing authorisation, is recommended as an option for the primary prevention of venous thromboembolic events in adults who have undergone elective total hip replacement surgery or elective total knee replacement surgery. Please refer to NICE technology appraisal guidance 157 (2018 V replaces 2008). Dabigatran for the prevention of venous thromboembolism after hip or knee replacement surgery in adults. Available at www.nice.org.uk/guidance/ta157

- Consider intermittent pneumatic compression if pharmacological prophylaxis is contraindicated in people undergoing elective knee replacement surgery. Continue until the person is mobile. Foot Impulse device such as GEKO can also be considered if none of the other options are suitable and are contraindicated.

On admission:

Intermittent pneumatic Compression/mechanical prophylaxis ***plus*** pharmacological prophylaxis as follows: With Tinzaparin (see dose in table above and for further details see page 16 of Trust VTE Prophylaxis policy) or suitable alternatives

Management after surgery:
LMWH starting 6–12 hours after surgery
LMWH prophylaxis should be continued for 2 weeks (14 days) after surgery.
The total amount of prophylaxis required should be supplied by the hospital on discharge to complete the course and the patient issued with appropriate written (Trust Patient Information Leaflet on VTE prevention)and verbal advice
TED stockings are not required

2.3 Non-arthroplasty orthopaedic knee surgery

- Be aware that VTE prophylaxis is generally not needed for people undergoing arthroscopic knee surgery where: total anaesthesia time is less than 90minutes **and** the person is at low risk of VTE.
- Consider LMWH 6–12 hours after surgery for 14 days for people undergoing arthroscopic knee surgery if:
  - total anaesthesia time is more than 90minutes **or**
  - the person's risk of VTE outweighs their risk of bleeding.
- Consider VTE prophylaxis for people undergoing other knee surgery (for example, osteotomy or fracture surgery) whose risk of VTE outweighs their risk of bleeding.

2.4 Foot and ankle orthopaedic surgery

- Consider pharmacological VTE prophylaxis for people undergoing foot or ankle surgery: that requires immobilisation (for example, arthrodesis or arthroplasty);consider stopping prophylaxis if immobilisation continues beyond 42 days **or** when total anaesthesia time is more than 90minutes or the person's risk of VTE outweighs their risk of bleeding

2.5 Upper limb orthopaedic surgery

- Be aware that VTE prophylaxis is generally not needed if giving local or regional anaesthetic for upper limb surgery.
- Consider VTE prophylaxis for people undergoing upper limb surgery if the person's total time under general anaesthetic is over 90 minutes or where their operation is likely to make it difficult for them to mobilise.

2.6 For both groups (Hip and Knee replacement)

Can also choose one of the alternative pharmacological options below along with mechanical measures for VTE prophylaxis:

Knee replacement	
Rivaroxaban	10mg once daily, starting 6-10 hours post-surgery for 2 weeks
Dabigatran Etexilate	Stat dose 110mg within 1–4 hours of surgery. Thereafter, 220mg once daily for 10 days after knee replacement (if either moderate renal impairment, >75 years, concurrent amiodarone: Stat 75mg, 150mg thereafter)
Apixaban	2.5mg twice daily, starting 12-24 hours after surgery Continue for 10-14 days post-surgery
Hip replacement	
Rivaroxaban	10mg once daily, starting 6-10 hours post-surgery for 5 weeks
Dabigatran Etexilate	Stat dose 110mg within 1–4 hours of surgery. Thereafter, 220mg once daily for 28 -35 days after hip replacement. (if either moderate renal impairment, >75 years, concurrent amiodarone: Stat 75mg, 150mg thereafter)
Apixaban	2.5mg twice daily, starting 12-24 hours after surgery Continue for 32 to 38 days post-surgery

- Give the last dose no less than 12 hours before surgery for LMWH or 24 hours before surgery for fondaparinux sodium.

- Unfractionated heparin for patients with severe renal impairment or established renal failure, started 6–12 hours after surgery
- Please refer to related Trust anticoagulation guidelines including Guidelines on peroi procedural management of patients on Oral Anticoagulants and Anti Platelet Medicines available in OLI at: http://oli.xelht.nhs.uk/sorce/beacon/singlepageview.aspx?pii=589&row=1542&SPVPrimaryMenu=5&SPVReferrer=Policies

3 Other orthopaedic surgery

- Consider offering combined VTE prophylaxis with mechanical and pharmacological methods to patients having orthopaedic surgery based on an assessment of risks and after discussion with the patient.
- Start mechanical VTE prophylaxis at admission. Choose one of the following, based on individual patient factors: used with caution, , intermittent pneumatic compression devices (thigh or knee length) or foot impulse devices and TED stockings in selected cases. Continue mechanical VTE prophylaxis until patient no longer has significantly reduced mobility.
- Start pharmacological VTE prophylaxis 6–12 hours after surgery. Choose one of: LMWH, UFH (for patients with severe renal impairment or established renal failure).Continue pharmacological VTE prophylaxis until the patient no longer has significantly reduced mobility.
- All patients need to be given advice about VTE prevention which includes early mobilisation, maintenance of hydration and the signs of DVT/PE. Please provide ELHT Patient Information Leaflet on VTE prevention.

Appendix 5: VTE Prophylaxis Interventions for people with major trauma

- Complete VTE risk assessment on admission for all patients admitted with trauma after emergency initial care and stabilisation.
-
- Offer mechanical VTE prophylaxis with intermittent pneumatic compression on admission to people with serious or major trauma. Continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.

- Reassess risk of VTE and bleeding within 24 hours of admission, whenever their clinical condition changes ***and at least daily***.

- Consider pharmacological VTE prophylaxis for people with serious or major trauma as soon as possible after the risk assessment when the risk of VTE outweighs the risk of bleeding. ***Continue for a minimum of 7 days***. Continue pharmacological VTE prophylaxis until the patient no longer has significantly reduced mobility

- Note: With regards to mechanical VTE prophylaxis in appropriately assessed patients can also consider choice of anti-embolism stockings (thigh or knee length) used with caution, or foot impulse devices in selected cases where nil other prophylactic option is suitable and with consultant input (GEKO). Continue mechanical VTE prophylaxis until the patient no longer has significantly reduced mobility.

- Contraindications to early initiation of Enoxaparin in trauma include:
    - The presence of Intracranial bleeding (head injury without frank haemorrhage is not a contraindication)
    - On-going and uncontrolled bleeding
    - Uncorrected major coagulopathy
    - Incomplete spinal cord injury associated with peri spinal haematoma

- Doppler Ultrasound Screening should be considered in high-risk patients who have received suboptimal prophylaxis further to consultant input and tailored to individual patient background. High risk patients might include:
    - Spinal cord injury
    - Lower extremity or pelvic fracture
    - Major head injury
    - Indwelling femoral venous line

NB
• **Inferior Vena Caval filters** are not recommended as primary prophylaxis as routine
• **Inferior Vena Caval filter insertion** is indicated in the presence of proven proximal DVT when either full anticoagulation is contraindicated or major surgery is planned in the near future

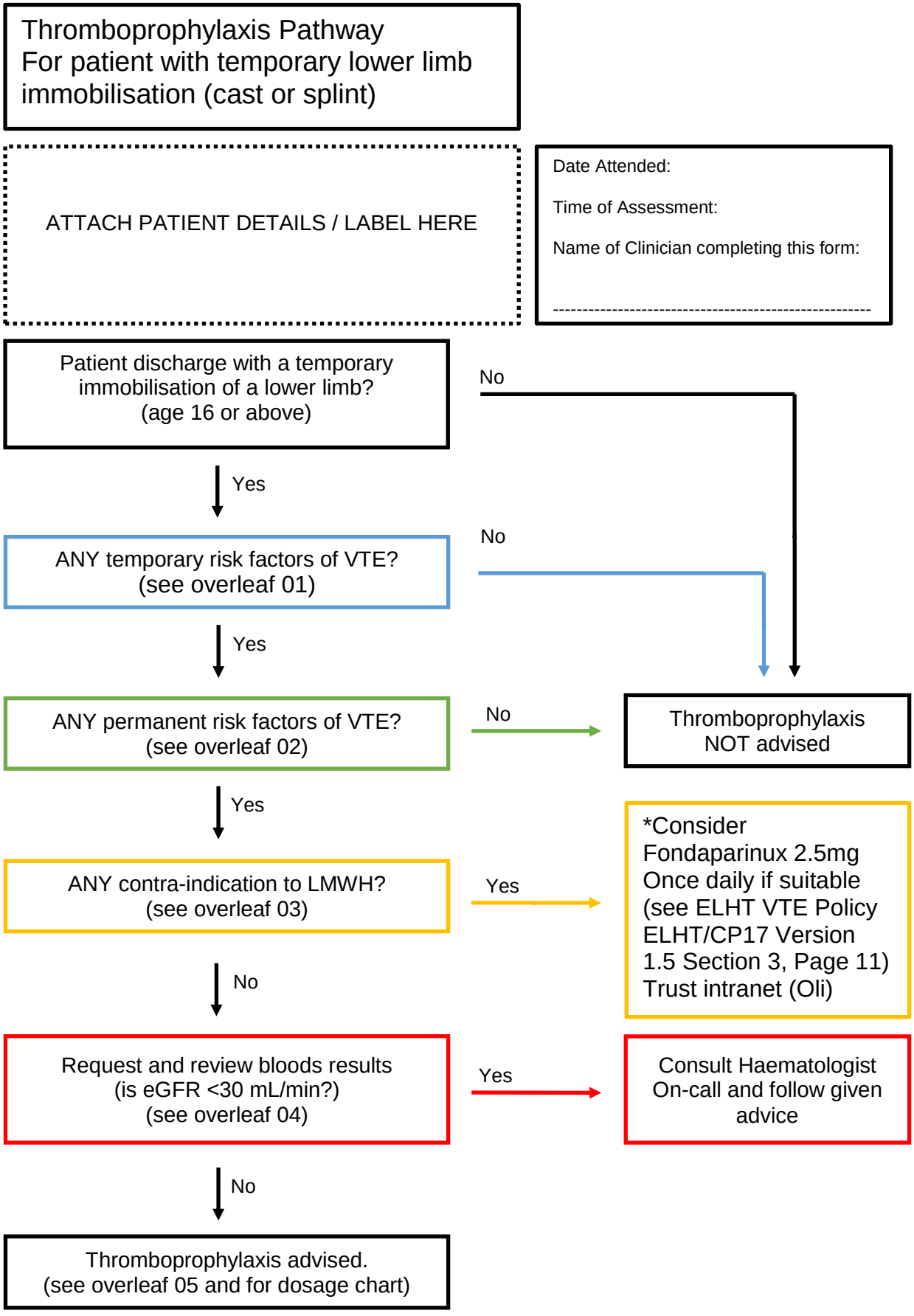
Note: For patients who may prefer alternatives to LMWH due to animal nature of origin, Fondaparinux or one of the direct oral anticoagulants (DOACs) may be an alternative option to consider, based on clinical judgement after discussing their suitability, advantages and disadvantages with the patient. (DOACs or Fondaparinux are not recommended in those with active cancer). For full details on the relevant DOAC, please refer to Appendix 2 and the full NICE technology guidance on each DOAC as referred to in the supporting references section of this policy document in pages 2 and 3 as below.

Enoxaparin dosage chart –see next page

Dosing is as per the product license for medical and surgical prophylaxis and additional expert advice from other organisations. Please refer to separate local Maternity Services Guidelines G22 on thrombo-prophylaxis dosing relating to pregnancy, pre and post-delivery.

Medical and Surgical patients at high risk for VTE as per VTE risk assessment	**STANDARD DOSE**	RENAL DOSE in Chronic Kidney Disease (Creatinine clearance <30mL/min)
Patient weight <50kg	**Enoxaparin 20mg once daily**	Enoxaparin 20mg once daily
Patient weight 50 to 120kg	**Enoxaparin 40mg once daily***	Enoxaparin 20mg once daily
Patient weight >120 to150kg	**Enoxaparin 40mg Twice daily**	Enoxaparin 40mg once daily
Patient weight >150kg	**Enoxaparin 60mg Twice daily**	Enoxaparin 40mg once daily
NB *Actual* body weight should be used for dose calculation		
Patients at moderate risk of VTE The ELHT VTE Risk Assessment tool identifies patients at high risk of VTE requiring pharmacological thromboprophylaxis at a dose of enoxaparin 40mg once daily. * However, a lower dose of 20mg once daily enoxaparin may be considered in surgical patients at moderate risk of VTE at the consultant's discretion.		

Appendix 6: VTE Prophylaxis Care Pathway Interventions for people with Lower Limb fractures managed with plaster cast



01 – **ANY ONE** of the Temporary risk of VTE?

Rigid immobilisation in plaster cast	Yes / No
Non-weight bearing status (to include splint, non-weight bearing crutches)	Yes / No
Severe injury – fracture / dislocation / complete tendon rupture	Yes / No

02 – **ANY ONE** of the Permanent risk of VTE?

Current hormone therapy (COCP, HRT, tamoxifen)	Yes / No
Personal or 1st degree relative VTE history	Yes / No
Active smoker	Yes / No
Any recent hospital admission / major surgery (within 6 weeks)	Yes / No
Pregnant or post-partum (within 6 weeks)	Yes / No
Any serious medical comorbidity including cardiac failure / COPD / chronic renal failure or inflammatory bowel disease	Yes / No
Extensive varicosities	Yes / No
Active cancer	Yes / No
Obesity (BMI > 30)	Yes / No
Known thrombophilia	Yes / No
Age 60 or above	Yes / No
Any other past medical history increase risk of VTE (Please specify)	Yes / No

03 – **ANY ONE** contra-indications to LMWH:

Haemophilia / other haemorrhagic disorder	Yes / No
Thrombocytopaenia or previous Heparin induced thrombocytopaenia	Yes / No
Recent cerebral haemorrhage or severe hypertension (>230/120mmHg)	Yes / No
Anticoagulated (i.e warfarin or rivaroxaban/apixaban/dabigatran/endoxban	Yes / No
Active peptic ulcer / recent gastrointestinal bleeding	Yes / No
Recent major trauma / surgery to eye or nervous system	Yes / No
Hypersensitivity to any form of heparin *Consider Fondaparinux in the absence of any other contraindications*	Yes / No
Risk deemed to outweigh benefits by clinician (Please specify)	Yes / No

04 – Blood tests

Obtained and review Bloods results (FBC, U&E's LFT, Coag, eGFR for all patients)	Yes / No
Any patient with eGFR<30 ml/min or low platelet count to be discussed with haematologist	Yes / No / NA

05 – Thromboprophylaxis is advised

Prescribe prophylactic dose of subcutaneous **Enoxaparin** in patients ED notes and to be given in department	Yes
Prescribe prophylactic dose of subcutaneous **Enoxaparin** as TTO until date of orthopaedic review or fracture clinic (usually within 7 days)	Yes
Patients educated regarding subcutaneous injection technique OR district nurse referral for ongoing injections	Yes
Safety netting discussed re: Bleeding complications	Yes / No

Enoxaparin dosage chart –see next page

Dosing is as per the product license for medical and surgical prophylaxis and additional expert advice from other organisations. Please refer to separate local Maternity Services Guidelines G22 on thrombo-prophylaxis dosing relating to pregnancy, pre and post-delivery.

Medical and Surgical patients at high risk for VTE as per VTE risk assessment	**STANDARD DOSE**	RENAL DOSE in Chronic Kidney Disease (Creatinine clearance <30mL/min)
Patient weight <50kg	**Enoxaparin 20mg once daily**	Enoxaparin 20mg once daily
Patient weight 50 to 120kg	**Enoxaparin 40mg once daily***	Enoxaparin 20mg once daily
Patient weight >120 to150kg	**Enoxaparin 40mg Twice daily**	Enoxaparin 40mg once daily
Patient weight >150kg	**Enoxaparin 60mg Twice daily**	Enoxaparin 40mg once daily
NB *Actual* body weight should be used for dose calculation		
Patients at moderate risk of VTE The ELHT VTE Risk Assessment tool identifies patients at high risk of VTE requiring pharmacological thromboprophylaxis at a dose of enoxaparin 40mg once daily. * However, a lower dose of 20mg once daily enoxaparin may be considered in surgical patients at moderate risk of VTE at the consultant's discretion.		

Appendix 7: VTE Prophylaxis Interventions for people having Abdominal, Bariatric, Thoracic , Head and Neck surgery, ENT surgery, Cardiac or Vascular surgery, Lower limb amputation, Varicose vein surgery

1 Enoxaparin VTE Prophylaxis Dosing Regimen:

Dosing is as per the product license for medical and surgical prophylaxis and additional expert advice from other organisations. Please refer to separate local Maternity Services Guidelines G22 on thrombo-prophylaxis dosing relating to pregnancy, pre and post-delivery.

Medical and Surgical patients at high risk for VTE as per VTE risk assessment	**STANDARD DOSE**	RENAL DOSE in Chronic Kidney Disease (Creatinine clearance <30mL/min)
Patient weight <50kg	**Enoxaparin 20mg once daily**	Enoxaparin 20mg once daily
Patient weight 50 to 120kg	**Enoxaparin 40mg once daily***	Enoxaparin 20mg once daily
Patient weight >120 to150kg	**Enoxaparin 40mg Twice daily**	Enoxaparin 40mg once daily
Patient weight >150kg	**Enoxaparin 60mg Twice daily**	Enoxaparin 40mg once daily
NB *Actual* body weight should be used for dose calculation		
Patients at moderate risk of VTE The ELHT VTE Risk Assessment tool identifies patients at high risk of VTE requiring pharmacological thromboprophylaxis at a dose of enoxaparin 40mg once daily. * However, a lower dose of 20mg once daily enoxaparin may be considered in surgical patients at moderate risk of VTE at the consultant's discretion.		

The drug is given subcutaneously depending upon time of admission, nature of surgery, type of anaesthesia and other patient factors usually at 6pm if on once daily regimen or as recommended by consultant. Doses must be prescribed as units and dose volume in mL, and state the indication as PROPHYLAXIS on the prescription chart. Patient's weight must always be recorded on the prescription chart.

2 Abdominal surgery

Offer VTE prophylaxis to people undergoing abdominal (gastrointestinal, gynaecological, urological) surgery who are at increased risk of VTE.

- Start mechanical VTE prophylaxis on admission for people undergoing abdominal surgery. Choose either:
  - anti-embolism stockings or
  - intermittent pneumatic compression.

- Continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.
- Add pharmacological VTE prophylaxis for a minimum of 7 days for people undergoing abdominal surgery whose risk of VTE outweighs their risk of bleeding, taking into account individual patient factors and according to clinical judgement. Choose either:
  - LMWH or
  - fondaparinux sodium
- Consider extending pharmacological VTE prophylaxis to 28 days postoperatively for people who have had major cancer surgery in the abdomen.

3 Bariatric surgery

- Offer VTE prophylaxis to people undergoing bariatric surgery.
- Start mechanical VTE prophylaxis on admission for people undergoing bariatric surgery. Choose either:
  - anti-embolism stockings or
  - intermittent pneumatic compression.
- Continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.
- Add pharmacological VTE prophylaxis for people undergoing bariatric surgery for a minimum of 7 days for people whose risk of VTE outweighs their risk of bleeding. Choose either:
  - LMWH
  - fondaparinux sodium

4 Thoracic surgery

- Consider VTE prophylaxis for people undergoing thoracic surgery who are at increased risk of VTE.
- Start mechanical VTE prophylaxis on admission for people undergoing thoracic surgery. Choose either:
  - anti-embolism stockings or
  - intermittent pneumatic compression.
- Continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.
- Consider adding pharmacological VTE prophylaxis for people undergoing thoracic surgery for a minimum of 7 days to people whose risk of VTE outweighs their risk of bleeding:
- Use LMWH as first-line treatment.
- If LMWH is contraindicated, use fondaparinux sodium.

5 Head and neck surgery

Oral and maxillofacial surgery

- Consider pharmacological VTE prophylaxis with LMWH for a minimum of 7 days for people undergoing oral or maxillofacial surgery whose risk of VTE outweighs their risk of bleeding.
- Consider mechanical VTE prophylaxis on admission for people undergoing oral or maxillofacial surgery who are at increased risk of VTE and high risk of bleeding. Choose either:
  - anti-embolism stockings or
  - intermittent pneumatic compression.
- Continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.

6 ENT surgery

- Consider pharmacological VTE prophylaxis with LMWH[4] for a minimum of 7 days for people undergoing ears, nose or throat (ENT) surgery whose risk of VTE outweighs their risk of bleeding.
- Consider mechanical VTE prophylaxis on admission for people undergoing ENT surgery who are at increased risk of VTE and high risk of bleeding. Choose either:
  - anti-embolism stockings or
  - intermittent pneumatic compression.
- Continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.

7 Interventions for people having cardiac or vascular surgery

Cardiac surgery

- Consider mechanical VTE prophylaxis on admission for people who are undergoing cardiac surgery who are at increased risk of VTE. Choose either:
  - anti-embolism stockings or
  - intermittent pneumatic compression.
- Continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.
- Consider adding pharmacological VTE prophylaxis for a minimum of 7 days for people who are undergoing cardiac surgery and are not having other anticoagulation therapy:
- Use LMWH as first-line treatment.
- If LMWHis contraindicated, use fondaparinux sodium

8 Vascular surgery

Open vascular surgery or endovascular aneurysm repair

- Consider pharmacological VTE prophylaxis with LMWH[4] for a minimum of 7 days for people who are undergoing open vascular surgery or major endovascular procedures, including endovascular aneurysm repair whose risk of VTE outweighs their risk of bleeding.
- Consider mechanical VTE prophylaxis on admission for people who are undergoing open vascular surgery or major endovascular procedures, including endovascular aneurysm repair, if pharmacological prophylaxis is contraindicated. Choose either:
  - anti-embolism stockings or
  - intermittent pneumatic compression.
- Continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.

9 Lower limb amputation

- Consider pharmacological VTE prophylaxis with LMWH[4] for a minimum of 7 days for people who are undergoing lower limb amputation whose risk of VTE outweighs their risk of bleeding.
- Consider mechanical VTE prophylaxis with intermittent pneumatic compression on the contralateral leg, on admission, for people who are undergoing lower limb amputation and if pharmacological prophylaxis is contraindicated.
- For people undergoing lower limb amputation, continue mechanical VTE prophylaxis until the person no longer has significantly reduced mobility relative to their anticipated mobility.

10 Varicose vein surgery

- Be aware that VTE prophylaxis is generally not needed for people undergoing varicose vein surgery where:
  - total anaesthesia time is less than 90minutes and
  - the person is at low risk of VTE.
- Consider pharmacological VTE prophylaxis with LMWH[4], starting 6–12 hours after surgery and continuing for 7 days for people undergoing varicose vein surgery if:
  - total anaesthesia time is more than 90minutes or
  - the person's risk of VTE outweighs their risk of bleeding.
- Consider mechanical VTE prophylaxis with anti-embolism stockings, on admission, for people undergoing varicose vein surgery: who are at increased risk of VTE and if pharmacological prophylaxis is contraindicated.
- If using anti-embolism stockings for people undergoing varicose vein surgery, continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility. [2018]

11 Patients undergoing major surgery for malignancy

- Consider extended pharmacological VTE prophylaxis to 28 days postoperatively for patients who have had major cancer surgery in the abdomen or pelvis

Caution: Do not offer pharmacological VTE prophylaxis to patients with ruptured cranial or spinal vascular malformations (for example, brain aneurysms) or acute traumatic or non-traumatic haemorrhage until the lesion has been secured or the condition is stable.

Note: For patients, who may prefer alternatives to LMWH due to animal nature of origin, Fondaparinux or one of the direct oral anticoagulants (DOACs) may be an alternative option to consider, based on clinical judgement after discussing their suitability, advantages and disadvantages with the patient. (Please note: DOACs or Fondaparinux are not recommended in those with active cancer. ***Please refer to Appendix 2 for details on DOACs***)

Appendix 8: VTE Prophylaxis in Medical patients

Acutely ill medical patients (please also refer to section 10.3.1.3).
Offer pharmacological VTE prophylaxis for a minimum of 7 days to acutely ill medical patients whose risk of VTE outweighs their risk of bleeding: Use LMWH as first-line treatment. If LMWH is contraindicated, use fondaparinux sodium.

General medical patients
High Risk: Offer pharmacological VTE prophylaxis to general medical patients assessed to be at increased risk of VTE. Choose any one of: fondaparinux sodium, low molecular weight heparin (LMWH), unfractionated heparin (UFH) (for patients with severe renal impairment or established renal failure).Start pharmacological VTE prophylaxis as soon as possible after risk assessment has been completed. Continue until the patient is no longer at increased risk of VTE.

If risk of VTE outweighs risk of bleeding and pharmacological prophylaxis NOT contra-indicated: Prophylactic Enoxaparin subcutaneously (*Pharmacological VTE prophylaxis MUST be prescribed and administered as soon as possible after risk assessment on admission).*

Enoxaparin VTE Prophylaxis Dosing Regimen:
Dosing is as per the product license for medical and surgical prophylaxis and additional expert advice from other organisations. Please refer to separate local Maternity Services Guidelines G22 on thrombo-prophylaxis dosing relating to pregnancy, pre and post-delivery.

Medical and Surgical patients at high risk for VTE as per VTE risk assessment	**STANDARD DOSE**	RENAL DOSE in Chronic Kidney Disease (Creatinine clearance <30mL/min)
Patient weight <50kg	**Enoxaparin 20mg once daily**	Enoxaparin 20mg once daily
Patient weight 50 to 120kg	**Enoxaparin 40mg once daily***	Enoxaparin 20mg once daily
Patient weight >120 to150kg	**Enoxaparin 40mg Twice daily**	Enoxaparin 40mg once daily
Patient weight >150kg	**Enoxaparin 60mg Twice daily**	Enoxaparin 40mg once daily
NB *Actual* body weight should be used for dose calculation		
Patients at moderate risk of VTE The ELHT VTE Risk Assessment tool identifies patients at high risk of VTE requiring pharmacological thromboprophylaxis at a dose of enoxaparin 40mg once daily. * However, a lower dose of 20mg once daily enoxaparin may be considered in surgical patients at moderate risk of VTE at the consultant's discretion.		

The drug is given subcutaneously depending upon time of admission, nature of surgery, type of anaesthesia and other patient factors usually at 6pm if on once daily regimen or as recommended by consultant. Doses must be prescribed as units and dose volume in mL, and state the indication as PROPHYLAXIS on the prescription chart. Patient's weight must always be recorded on the prescription chart.

If risk of VTE outweighs risk of bleeding and pharmacological prophylaxis IS contra-indicated: Apply thigh-length graduated compression elastic stockings (unless contra-indicated, for example, in patients with established peripheral arterial disease or diabetic neuropathy). If thigh length stockings are considered inappropriate due to- compliance or fit, then knee-length stockings maybe used. Treat as above until the risk of thromboembolism has diminished (based on risk assessment tool)
Low Risk Early mobilisation should be considered in all patients.

Stroke Patients

- Do not offer anti-embolism stockings for VTE prophylaxis to patients who are admitted for stroke.

- Review by Stroke Consultant to consider risks/benefits of pharmacological prophylaxis.

- Consider offering prophylactic-dose LMWH(or UFH for patients with severe renal impairment or established renal failure) if: a diagnosis of haemorrhagic stroke has been excluded, and the risk of bleeding (haemorrhagic transformation of stroke or bleeding into another site) is assessed to be low, and the patient has one or more of: major restriction of mobility, previous history of VTE, dehydration, comorbidities (such as malignant disease).

- Continue until the acute event is over and the patient's condition is stable.

- Do not offer foot impulse or neuromuscular electrical stimulation devices for VTE prophylaxis to patients who are admitted for stroke, except in the context of research.

- Consider intermittent pneumatic compression (IPC) for VTE prophylaxis in immobile patients who are admitted within 3 days of acute stroke.

- Explain to patient or their family members or carers (as appropriate) that: it reduces the risk of deep vein thrombosis and may provide an increase in survival, it will not help them recover from stroke, and there may be an associated increased risk of surviving with severe disability.

- When using intermittent pneumatic compression for patients who are admitted for stroke, provide it for 30 days or until the patient is mobile or discharged, whichever is sooner.

- Note: For patients, who may prefer alternatives to LMWH due to animal nature of origin, Fondaparinux or one of the direct oral anticoagulants (DOACs) may be an alternative option to consider, based on clinical judgement after discussing their suitability, advantages and disadvantages with the patient.

- (Please note: DOACs or Fondaparinux are not recommended in those with active cancer. Please refer to Appendix 2 for details on DOACs). Please also refer to pages 10-17)

Appendix 9: PRESCRIBING UNLICENSED MEDICINES- GMC GUIDANCE

Please Note: This information is for prescribers to be used in clinical scenarios where Unlicensed Medications are considered for prescribing. This should be in the presence of appropriate Clinical Indications after Risk assessment and in the absence of contraindications where a suitable licensed alternative is not available.

Please see the GMC guidance available on: https://www.gmc-uk.org/ethical-guidance/ethical-guidance-for-doctors/prescribing-and-managing-medicines-and-devices/prescribing-unlicensed-medicines

Healthcare professionals may have more responsibility to accurately prescribe an unlicensed medicine or an off-label medicine than when they prescribe a medicine within the terms of its licence. Please refer to gov.uk guidance for all prescribers regarding unlicensed medicine prescribing available at: https://www.gov.uk/drug-safety-update/off-label-or-unlicensed-use-of-medicines-prescribers-responsibilities

The term 'unlicensed medicine' is used to describe medicines that are used outside the terms of their UK licence or which have no licence for use in the UK.[22] Unlicensed medicines are commonly used in some areas of medicine such as in paediatrics, psychiatry and palliative care. They are also used, less frequently, in other areas of medicine.

You should usually prescribe licensed medicines in accordance with the terms of their licence. However, you may prescribe unlicensed medicines where, on the basis of an assessment of the individual patient, you conclude, for medical reasons, that it is necessary to do so to meet the specific needs of the patient.

Prescribing unlicensed medicines may be necessary where:

a. There is no suitably licensed medicine that will meet the patient's need. Examples include (but are not limited to), for example, where:

i. there is no licensed medicine applicable to the particular patient. For example, if the patient is a child and a medicine licensed only for adult patients would meet the needs of the child; or

ii. a medicine licensed to treat a condition or symptom in children would nonetheless not meet the specific assessed needs of the particular child patient, but a medicine licensed for the same condition or symptom in adults would do so; or

iii. the dosage specified for a licensed medicine would not meet the patient's need; or

iv. the patient needs a medicine in a formulation that is not specified in an applicable licence.

b. Or where a suitably licensed medicine that would meet the patient's need is not available. This may arise where, for example, there is a temporary shortage in supply; or

c. The prescribing forms part of a properly approved research project.

When prescribing an unlicensed medicine you must:

a. be satisfied that there is sufficient evidence or experience of using the medicine to demonstrate its safety and efficacy

b. take responsibility for prescribing the medicine and for overseeing the patient's care, monitoring, and any follow up treatment, or ensure that arrangements are made for another suitable doctor to do so

c. make a clear, accurate and legible record of all medicines prescribed and, where you are not following common practice, your reasons for prescribing an unlicensed medicine.

Information for patients about the license for their medicines

You must give patients (or their parents or carers) sufficient information about the medicines you propose to prescribe to allow them to make an informed decision.

Some medicines are routinely used outside the terms of their licence, for example in treating children.

In emergencies or where there is no realistic alternative treatment and such information is likely to cause distress, it may not be practical or necessary to draw attention to the licence.

In other cases, where prescribing unlicensed medicines is supported by authoritative clinical guidance, it may be sufficient to describe in general terms why the medicine is not licensed for the proposed use or patient population.

You must always answer questions from patients (or their parents or carers) about medicines fully and honestly.

If you intend to prescribe unlicensed medicines where that is not routine or if there are suitably licensed alternatives available, you should explain this to the patient, and your reasons for doing so.

You should be careful about using medical devices for purposes for which they were not intended.

Appendix 10: VTE Prophylaxis Interventions for pregnant women and women who gave birth or had a miscarriage or termination of pregnancy in the past 6 weeks

NICE Guideline March 2018 recommends the below:

- Consider LMWH for all women who are admitted to hospital or a midwife-led unit if they are pregnant or gave birth, had a miscarriage or had a termination of pregnancy in the past 6 weeks, and whose risk of VTE outweighs their risk of bleeding.

- Do not offer VTE prophylaxis to women admitted to hospital or a midwife-led unit who are in active labour.

- Stop pharmacological VTE prophylaxis when women are in labour.

- If using LMWH in pregnant women, start it as soon as possible and within 14 hours of the risk assessment being completed and continue until the woman is no longer at increased risk of VTE or until discharge from hospital or the midwife-led unit.

- If using LMWH in women who gave birth or had a miscarriage or termination of pregnancy, start 4–8 hours after the event unless contraindicated and continue for a minimum of 7 days.

- Consider combined prophylaxis with LMWH plus mechanical prophylaxis for pregnant women or women who gave birth or had a miscarriage or termination of pregnancy in the past 6 weeks and who are likely to be immobilised, or have significantly reduced mobility relative to their normal or anticipated mobility for 3 or more days after surgery, including caesarean section:

- Use intermittent pneumatic compression as first-line treatment.

- If intermittent pneumatic compression is contraindicated, use anti-embolism stockings.

- Continue until the woman no longer has significantly reduced mobility relative to her normal or anticipated mobility or until discharge from hospital.

Please refer to Maternity Services Guideline G22 on Thromboprophylaxis in Obstetrics available in Trust intranet/OLI for further details