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1.0 INTRODUCTION / PURPOSE OF POLICY

1.1 Background

Venous thromboembolism (VTE) is the formation of a blood clot (thrombus) in a vein which may dislodge from its site of origin to cause an embolism. Most thrombi occur in the deep veins of the legs and pelvis; this is known as a deep vein thrombosis (DVT). Dislodged thrombus may travel to the lungs; this is called a pulmonary embolism (PE) and can be fatal. Thrombi can also cause long-term morbidity due to venous insufficiency and post-thrombotic syndrome, potentially leading to venous ulceration.

It has been well recognised for a number of years that the formation of thrombi is associated with inactivity and surgical procedures - the risk increasing with the duration of the operation and the period of immobility. However increasing evidence suggests that hospitalised medical patients, in particular those with restricted mobility and one or more risk factors for VTE, are at increased risk for VTE.

It is a silent killer, and it is often not until the patient has had a fatal pulmonary embolism that the condition is recognized. A recent American study estimated that one third of hospitalised patients are at risk of VTE [3] and it is estimated that thromboembolism kills more than 60,000 people in the UK a year.[4] More VTE are diagnosed during the three months after hospitalisation than while in hospital, however, less than half receive medications to prevent blood clots whilst an inpatient.

VTE has been identified by many researchers as a poorly managed risk, which if managed appropriately could save thousands of lives every year. It is difficult to predict which patients will develop VTE and it is therefore important to assess all hospital inpatients for their risk of VTE in order to determine which of them need additional prophylaxis.

Patients are at increased risk of venous thromboembolism (VTE) following admission to hospital. This policy aims to enable healthcare practitioners to identify patients at risk of developing VTE and select the appropriate therapy to reduce the associated mortality and morbidity risks associated with this disease.

An HSC Safety Forum VTE Advisory Group developed and agreed a single risk assessment tool for use throughout all HSC Trusts which should ensure that every adult patient has a documented VTE risk assessment on admission to hospital and that the risk assessment is conducted in accordance with clinical risk assessment criteria that reflect NICE clinical guideline CG92

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(Venous thromboembolism: reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in patients admitted to hospital. This BHSCT policy is based upon the Regional VTE risk assessment tool and the NICE clinical guideline CG92 and its update NG89.
The recommendations in this policy must be implemented taking into account the patient's individual clinical situation.

2.0 SCOPE OF THE POLICY

This policy applies to all adult patients aged over 16 years within the Belfast HSCT. For obstetrics - see clinical guideline "Thromboprophylaxis during pregnancy, labour and delivery" available on the BHSCT Intranet.

3.0 ROLES/RESPONSIBILITIES

This policy must be complied with by all staff responsible for the risk assessment and prevention of venous thromboembolism in Belfast Trust patients within the scope defined above.

3.1 Specific roles:
Completion of the VTE risk assessment as laid out in this policy is the responsibility of the prescriber. Prescribing responsibility lies with accredited prescribers looking after the patient. Ultimate overall responsibility remains with the consultant.
Where VTE risk assessments have not been completed, nursing and pharmacy staff should bring this to the attention of a member of medical staff looking after the patient and request that the risk assessment is completed. Such requests should be documented in the medical and/or nursing notes as appropriate.

4.0 KEY POLICY PRINCIPLES

1.1 Risk assessment

All patients

1.1.1 Assess all patients to identify the risk of venous thromboembolism (VTE) and bleeding (see recommendation 1.1.2 for all medical patients, 1.1.5 for all surgical patients, 1.1.9 for all pregnant women and all women who gave birth or had a miscarriage or termination of pregnancy in the past 6 weeks, 1.8.1 for all people admitted to the critical care unit and 1.9.1 for all acute psychiatric patients).

People admitted to hospital

Medical patients

1.1.2 Assess all medical patients to identify the risk of VTE and bleeding:

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As soon as possible after admission to hospital or by the time of the first consultant review using the risk assessment which is within the regional drug kardex.

1.1.3 Balance the person's individual risk of VTE against their risk of bleeding when deciding whether to offer pharmacological thromboprophylaxis to medical patients.

1.1.4 If using pharmacological VTE prophylaxis for medical patients, start it as soon as possible and within 14 hours of admission, unless otherwise stated in the population-specific recommendations (see sections 1.4 to 1.9).

Surgical and trauma patients

1.1.5 Assess all surgical and trauma patients to identify the risk of VTE and bleeding: As soon as possible after admission to hospital or by the time of the first consultant review using the risk assessment placed within the regional kardex.

1.1.6 Balance the person's individual risk of VTE against their risk of bleeding when deciding whether to offer pharmacological thromboprophylaxis to surgical and trauma patients.

1.1.7 If using pharmacological VTE prophylaxis for surgical and trauma patients, start it as soon as possible and within 14 hours of admission, unless otherwise stated in the population-specific recommendations (see sections 1.10 to 1.15).

Reassessment of risk of VTE and bleeding

1.1.8 Reassess all medical, surgical and trauma patients for risk of VTE and bleeding at the point of consultant review or if their clinical condition changes.

Pregnant women and women who gave birth or had a miscarriage or termination of pregnancy in the past 6weeks

1.1.9 Assess all women on admission to hospital or a midwife-led unit if they are pregnant or gave birth, had a miscarriage or termination of pregnancy in the past 6weeks, to identify their risk of VTE and bleeding. Use a tool published by a national, the most commonly used risk assessment tool was developed by the Royal College of Obstetricians and Gynaecologists.

1.1.10 Reassess risk of VTE and bleeding, and assess the need for thromboprophylaxis for all women:

- within 6 hours of giving birth, having a miscarriage or having a termination of pregnancy or
- if their clinical condition changes and they:
    - are pregnant or gave birth,
    - had a miscarriage or termination of pregnancy in the past 6weeks.

1.2 Giving information and planning for discharge

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

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1.2.2 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:

- written information available through regional leaflet WPH000887
- 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).

1.2.3 Be aware that heparins are of animal origin and this 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.

1.2.4 As part of the discharge plan, give patients and their family members or carers (as appropriate) verbal and written information (WPH000887) 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.

1.2.5 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.

1.2.6 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.

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1.2.7 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.

1.2.8 Notify the person's GP if the person has been discharged with pharmacological and/or mechanical VTE prophylaxis to be used at home.

1.3 All patients

Mechanical prophylaxis

1.3.1 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.

1.3.2 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.

1.3.3 Ensure that people who develop oedema or postoperative swelling have their legs re-measured and anti-embolism stockings refitted.

1.3.4 If arterial disease is suspected, seek expert opinion before fitting anti-embolism stockings.

1.3.5 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.)

1.3.6 Encourage people to wear their anti-embolism stockings day and night until they no longer have significantly reduced mobility.

1.3.7 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.

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1.3.8 Monitor the use of anti-embolism stockings and offer assistance if they are not being worn correctly.

1.3.9 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.

1.3.10 Do not offer intermittent pneumatic compression to people with a known allergy to the material of manufacture.

1.3.11 Advise the person to wear their device for as much time as possible.

Pharmacological prophylaxis

1.3.12 For pharmacological VTE prophylaxis in people under 18, follow the recommendations on apixaban, aspirin, dabigatran etexilate, fondaparinux sodium, low-molecular-weight heparin (LMWH) and rivaroxaban in this guideline. At the time of publication (March 2018), these drugs did not have a UK marketing authorisation for use in young people under 18 for this indication and as such are not recommended for use.

All surgery

1.3.13 Advise people to consider stopping oestrogen-containing oral contraceptives therapy 4 weeks before elective surgery. If stopped, provide advice on alternative contraceptive methods. Taking HRT may increase the risk of thromboembolism but this additional risk has not been well quantified. There is insufficient evidence to justify withdrawing HRT before elective surgery. Refer to the policy "Guidance on the Administration of medications in perioperative Adult patients". Elective surgery for further information.

Nursing care: early mobilisation and hydration

1.3.14 Encourage people to mobilise as soon as possible.
1.3.15 Do not allow people to become dehydrated unless clinically indicated.

People using antiplatelet agents

1.3.16 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.

People using anticoagulation therapy

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1.3.17 Consider VTE prophylaxis for people at increased risk of VTE who are interrupting anticoagulant therapy.

1.4 Interventions for people with acute coronary syndromes or acute stroke or for acutely ill patients

Acute coronary syndromes

1.4.1 Be aware that people receiving anticoagulant drugs as part of their treatment for an acute coronary syndrome do not usually need VTE prophylaxis. See also recommendation 1.3.17.

Acute stroke patients

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

1.4.3 Consider intermittent pneumatic compression for VTE prophylaxis for people who are immobile and admitted with acute stroke. If using, start it within 3 days of acute stroke.

1.4.4 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.

1.4.5 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.

Acutely ill medical patients

1.4.6 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.

1.5 Interventions for people with renal impairment(an estimated glomerular filtration rate (eGFR) of less than 30 ml/min/1.73m2)

1.5.1 If using pharmacological VTE prophylaxis for people with renal impairment, choose either LMWH or unfractionated heparin (UFH).

1.5.2 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.

1.6 Interventions for people with cancer

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1.6.1 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, except as outlined in recommendations 1.6.2 and 1.6.3, unless they are also at increased risk of VTE because of something other than the cancer.

1.6.2 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.

1.6.3 Consider pharmacological VTE prophylaxis with LMWH for people with pancreatic cancer who are receiving chemotherapy.

1.6.4 If giving VTE prophylaxis to people with cancer (see recommendations 1.6.2 and 1.6.3), continue for as long as they are receiving chemotherapy.

1.7 Interventions for people having palliative care

1.7.1 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.

1.7.2 Do not offer VTE prophylaxis to people in the last days of life.

1.7.3 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.

1.7.4 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.

1.8 Interventions for people admitted to critical care

1.8.1 Assess all people admitted to the critical care unit for risk of VTE and bleeding.

1.8.2 Provide LMWH to people admitted to the critical care unit if pharmacological VTE prophylaxis is not contraindicated. For people with renal impairment, see recommendations 1.5.1 and 1.5.2.

1.8.3 Consider mechanical VTE prophylaxis for people admitted to the critical care unit if pharmacological prophylaxis is contraindicated based on their condition or procedure.

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1.8.4 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.

1.8.5 Reassess VTE and bleeding risk daily for people in critical care units.

1.8.6 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.

1.9 Interventions for people with psychiatric illness

1.9.1 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 using the risk assessment provided within the regional kardex.

1.9.2 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.

1.9.3 Consider pharmacological VTE prophylaxis with LMWH for people admitted to an acute psychiatric ward whose risk of VTE outweighs their risk of bleeding.

1.9.4 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.
1.9.5 Continue pharmacological VTE prophylaxis for people admitted to an acute psychiatric ward until the person is no longer at increased risk of VTE.

1.10 Interventions when using anaesthesia

1.10.1 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.

1.10.2 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.

1.10.3 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.

1.11 Interventions for people having orthopaedic surgery

Lower limb immobilisation

1.11.1 Consider pharmacological VTE prophylaxis with LMWH or fondaparinux

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sodium for people with lower limb immobilisation whose risk of VTE outweighs their risk of bleeding. Consider stopping prophylaxis if lower limb immobilisation continues beyond 42 days.

Fragility fractures of the pelvis, hip and proximal femur

1.11.2 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.

1.11.3 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.

1.11.4 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. Continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.

Elective hip replacement

1.11.5 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. [This text is from rivaroxaban for the prevention of venous thromboembolism after total hip or total knee replacement in adults (NICE technology appraisal guidance 170).]

1.11.6 Consider one of the following if none of the options in recommendation 1.11.5 can be used:

- Apixaban is recommended as an option for the prevention of venous thromboembolism in adults after elective hip or knee replacement surgery. [This text is from apixaban for the prevention of venous thromboembolism after total hip or knee replacement in adults (NICE technology appraisal guidance 245).
- 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

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total knee replacement surgery. [This text is from dabigatran etexilate for the prevention of venous thromboembolism after hip or knee replacement surgery in adults (NICE technology appraisal guidance 157).

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

Elective knee replacement

1.11.8 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 the prevention of venous thromboembolism in adults having elective total hip replacement surgery or elective total knee replacement surgery. [This text is from rivaroxaban for the prevention of venous thromboembolism after total hip or total knee replacement in adults (NICE technology appraisal guidance 170).

1.11.9 Consider one of the following if none of the options in recommendation 1.11.8 can be used:

- Apixaban is recommended as an option for the prevention of venous thromboembolism in adults after elective hip or knee replacement surgery. [This text is from apixaban for the prevention of venous thromboembolism after total hip or knee replacement in adults (NICE technology appraisal guidance 245).
- 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. [This text is from dabigatran etexilate for the prevention of venous thromboembolism after hip or knee replacement surgery in adults (NICE technology appraisal guidance 157).

1.11.10 Consider intermittent pneumatic compression if pharmacological prophylaxis is contraindicated in people undergoing elective knee replacement surgery. Continue until the person is mobile.

Non-arthroplasty orthopaedic knee surgery

1.11.11 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.

1.11.12 Consider LMWH 6–12 hours after surgery for 14 days for people undergoing arthroscopic knee surgery if:

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- total anaesthesia time is more than 90minutes or
- the person's risk of VTE outweighs their risk of bleeding.

1.11.13 Consider VTE prophylaxis for people undergoing other knee surgery (for example, osteotomy or fracture surgery) whose risk of VTE outweighs their risk of bleeding.

Foot and ankle orthopaedic surgery

1.11.14 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 (see recommendation 1.11.1) or
- when total anaesthesia time is more than 90minutes or
- the person's risk of VTE outweighs their risk of bleeding.

Upper limb orthopaedic surgery

1.11.15 Be aware that VTE prophylaxis is generally not needed if giving local or regional anaesthetic for upper limb surgery.

1.11.16 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.

1.12 Interventions for people having elective spinal surgery or cranial surgery or people with spinal injury

Elective spinal surgery

1.12.1 Offer mechanical VTE prophylaxis on admission to people undergoing elective spinal surgery. Choose either:

- anti-embolism stockings or
- intermittent pneumatic compression.

Continue for 30 days or until the person is mobile or discharged, whichever is sooner.

1.12.2 Consider adding pharmacological VTE prophylaxis with LMWH for people undergoing elective spinal surgery whose risk of VTE outweighs their risk of bleeding, taking into account individual patient and surgical factors (major or complex surgery) and according to clinical judgement.

1.12.3 If using LMWH for people undergoing elective spinal surgery, start giving it 24–48 hours postoperatively according to clinical judgement, taking into account patient characteristics and surgical procedure. Continue for 30 days or until the person is mobile or discharged, whichever is sooner.

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1.12.4 If needed, start LMWH earlier than 24 hours after the operation for people undergoing elective spinal surgery. Base the decision on multidisciplinary or senior opinion, or a locally agreed protocol.

Cranial surgery

1.12.5 Consider mechanical VTE prophylaxis for people undergoing cranial surgery.

1.12.6 If using mechanical VTE prophylaxis for people undergoing cranial surgery, start it on admission. Choose either:

- anti-embolism stockings or
- intermittent pneumatic compression.

Continue for 30 days or until the person is mobile or discharged, whichever is sooner.

1.12.7 Consider adding pre-operative pharmacological VTE prophylaxis with LMWH. Give the last dose no less than 24 hours before surgery for people undergoing cranial surgery whose risk of VTE outweighs their risk of bleeding.

1.12.8 Consider adding pharmacological VTE prophylaxis with LMWH, starting 24–48 hours after surgery for people undergoing cranial surgery whose risk of VTE outweighs their risk of bleeding. Continue for a minimum of 7 days.

1.12.9 If needed, start LMWH earlier than 24 hours after the operation for people undergoing cranial surgery. Base the decision on multidisciplinary or senior opinion, or a locally agreed protocol.

1.12.10 Do not offer pharmacological VTE prophylaxis to people with ruptured cranial vascular malformations (for example, brain aneurysms) or people with intracranial haemorrhage (spontaneous or traumatic) until the lesion has been secured or the condition has stabilised.

Spinal injury

1.12.11 Consider mechanical VTE prophylaxis on admission for people with spinal injury. Choose either:

- anti-embolism stockings or
- intermittent pneumatic compression.

1.12.12 Reassess risk of bleeding 24 hours after initial admission in people with spinal injury.

1.12.13 Consider adding pharmacological VTE prophylaxis with LMWH 24 hours after initial admission for people with spinal injury who are not having surgery in the next 24–48 hours, if the benefit of reducing the risk of VTE outweighs the risk of bleeding.

1.12.14 Continue VTE prophylaxis in people with spinal injury for 30 days or until the person is mobile or discharged, whichever is sooner.

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1.13 Interventions for people with major trauma

1.13.1 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.

1.13.2 Reassess risk of VTE and bleeding in people with serious or major trauma whenever their clinical condition changes and at least daily.

1.13.3 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.

1.14 Interventions for people having abdominal, thoracic or head and neck surgery

Abdominal surgery

1.14.1 Offer VTE prophylaxis to people undergoing abdominal (gastrointestinal, gynaecological, urological) surgery who are at increased risk of VTE. For people undergoing bariatric surgery, follow recommendations 1.14.5–1.14.7.

1.14.2 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.

1.14.3 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.

1.14.4 Consider extending pharmacological VTE prophylaxis to 28 days postoperatively for people who have had major cancer surgery in the abdomen.

Bariatric surgery

1.14.5 Offer VTE prophylaxis to people undergoing bariatric surgery.

1.14.6 Start mechanical VTE prophylaxis on admission for people undergoing bariatric
surgery. Choose either:

- anti-embolism stockings or
- intermittent pneumatic compression.

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Continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.

1.14.7 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 or
- fondaparinux sodium.

Thoracic surgery

1.14.8 Consider VTE prophylaxis for people undergoing thoracic surgery who are at increased risk of VTE.

1.14.9 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.

1.14.10 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.

Head and neck surgery

Oral and maxillofacial surgery

1.14.11 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.

1.14.12 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.

ENT surgery

1.14.13 Consider pharmacological VTE prophylaxis with LMWH for a minimum of 7 days for people undergoing ears, nose or throat (ENT) surgery whose risk of VTE outweighs their risk of bleeding.

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1.14.14 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.

1.15 Interventions for people having cardiac or vascular surgery

Cardiac surgery

1.15.1 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.

1.15.2 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 LMWH is contraindicated, use fondaparinux sodium.

Vascular surgery

Open vascular surgery or endovascular aneurysm repair

1.15.3 Consider pharmacological VTE prophylaxis with LMWH 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.

1.15.4 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.

Lower limb amputation

1.15.5 Consider pharmacological VTE prophylaxis with LMWH for a minimum of 7 days for people who are undergoing lower limb amputation whose risk of VTE outweighs their risk of bleeding.

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1.15.6 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.

1.15.7 For people undergoing lower limb amputation, continue mechanical VTE prophylaxis until the person no longer has significantly reduced mobility relative to their anticipated mobility.

Varicose vein surgery

1.15.8 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.

1.15.9 Consider pharmacological VTE prophylaxis with LMWH, 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.

1.15.10 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.

1.15.11 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.

1.16 Interventions for pregnant women and women who gave birth or had a miscarriage or termination of pregnancy in the past 6 weeks

1.16.1 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 termination of pregnancy in the past 6 weeks, and whose risk of VTE outweighs their risk of bleeding.

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

1.16.3 Stop pharmacological VTE prophylaxis when women are in labour.

1.16.4 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.

1.16.5 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.

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1.16.6 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.

Dosing considerations.

If pharmacological VTE prophylaxis is indicated, prescribe enoxaparin 40mg s/c daily;

- <40kg or eGFR <30mls/min: 20mg s/c daily.
- >100kg: maximum dose of 60mg daily.
- morbidly obese, BMI>35 and medically ill: consider 0.6mg/kg daily.

In low-weight women (< 45 kg) and low-weight men (< 57 kg), an increase in enoxaparin exposure has been observed within the prophylactic dosage ranges (non-weight adjusted), which may lead to a higher risk of bleeding. Therefore, careful clinical monitoring is advised in these patients.

Routine monitoring of enoxaparin levels prescribed at a prophylactic dose is not recommended.

Renal function.
Adjust dose in renal impairment. If eGFR <30mls/min, prescribe enoxaparin 20mg s/c daily.

Potassium level.
Enoxaparin can contribute to hyperkalaemia, particularly in individuals with underlying renal impairment. LMWH can cause hypoaldosteronism, which may result in hyperkalaemia. Potassium should be monitored before and during treatment, particularly in patients at risk of high potassium e.g. renal impairment, ACE inhibitors, angiotensin II receptor blockers, potassium sparing diuretics etc.
In patients at risk of hyperkalemia, check potassium between days 5-7 and 10-14 and thereafter according to clinical judgement. Day 15 onwards no need for routine monitoring unless clinical condition changes or is likely to change in which case U &E as necessary.

- Full blood count.
- Check platelet count at baseline and day 5 then up to alternate days from day 5 to day 15 in the high risk group. Low risk of heparin induced thrombocytopenic thrombosis (HITT) with prophylactic dose enoxaparin but if suspected - contact haematologist immediately for advice on:
- 9-5 Monday – Friday, contact N Ireland Haemophilia Centre and Thrombosis Unit, Belfast City Hospital, extension number 40444.

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- **Out of hours, Bank Holidays etc., contact on call haematology specialty registrar via switchboard, Belfast City Hospital**

5.0 IMPLEMENTATION OF POLICY

5.1 Dissemination

To health professionals.
People going 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, and their carers.

6.0 MONITORING

Completion of the documented risk assessment continues as a monthly compliance audit.

7.0 EVIDENCE BASE / REFERENCES

NICE clinical guideline CG92/ NG89 Venous Thromboembolism – Reducing the Risk.

8.0 CONSULTATION PROCESS

Drugs & Therapeutics Committee
Standards and Guidelines Committee.
Assoc Medical Directors / Clinical Leads / Consultants

9.0 APPENDICES / ATTACHMENTS

None

10.0 EQUALITY STATEMENT

In line with duties under the equality legislation (Section 75 of the Northern Ireland Act 1998), Targeting Social Need Initiative, Disability discrimination and the Human Rights Act 1998, an initial screening exercise to ascertain if this policy should be subject to a full impact assessment has been carried out. The outcome of the Equality screening for this policy is:

Major impact ☐

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Minor impact ☐

No impact. X

11.0 DATA PROTECTION IMPACT ASSESSMENT

New activities that involve collecting and using personal data can result in privacy risks. In line with requirements of the General Data Protection Regulation (GDPR) and the Data Protection Act 2018 the Trust has to consider the impacts on the privacy of individuals and ways to mitigate against the risks. Where relevant an initial screening exercise should be carried out to ascertain if this policy should be subject to a full impact assessment (see Appendix 7). The guidance for conducting a Data Protection Impact Assessments (DPIA) can be found via this **link**.
The outcome of the DPIA screening for this policy is:

Not necessary – no personal data involved ☐

A full data protection impact assessment is required ☐

A full data protection impact assessment is not required ☐

If a full impact assessment is required the author (Project Manager or lead person) should go ahead and begin the process. Colleagues in the Information Governance Team will provide assistance where necessary.

12.0 RURAL IMPACT ASSESSMENTS

From June 2018 the Trust has a legal responsibility to have due regard to rural needs when developing, adopting, implementing or revising policies, strategies and plans, and when designing and delivering public services.
It is your responsibility as policy or service lead to consider the impact of your proposal on people in rural areas – you will need to refer to the shortened rural needs assessment template and summary guidance on the Belfast Trust Intranet. Each Directorate/Division has a Rural Needs Champion who can provide support/assistance in this regard if necessary.

13.0 REASONABLE ADJUSTMENTS ASSESSMENT

Under the Disability Discrimination Act 1995 (as amended), the Trust has a duty to make reasonable adjustments to ensure any barriers disabled people face in gaining and remaining in employment and in accessing and using goods and services are removed or reduced. It is therefore recommended the policy explicitly references "reasonable adjustments will be considered for people who are disabled - whether as service users, visitors or employees.

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SIGNATORIES

(Policy – Guidance should be signed off by the author of the policy and the identified responsible director).

[redacted]

Author **Date:** 12/02/2020

[redacted]

Director **Date:** 12/02/2020

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