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Salford Royal NHS Foundation Trust (SRFT)
Pennine Acute Hospitals NHS Trust (PAT)

Northern Care Alliance NHS Group

Venous thromboembolism (deep vein thrombosis and pulmonary embolism) in patients 16 years of age and over admitted to hospital (Prevention of) (Excluding Obstetrics)

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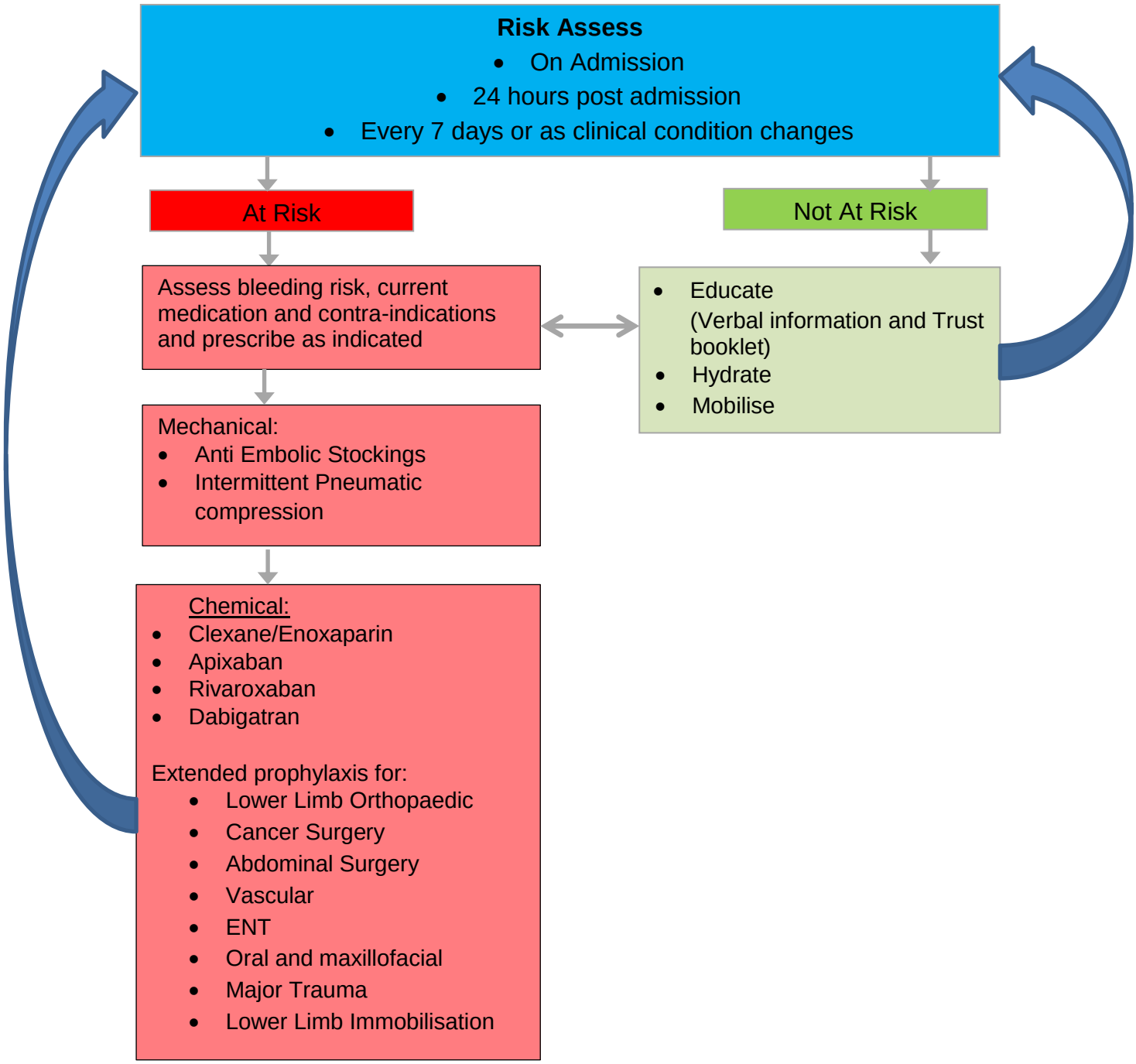
Document Summary Sheet

Policy for Prevention of Venous thromboembolism (deep vein thrombosis and pulmonary embolism) in patients 16 years of age and over admitted to hospital. CPSU017, Version 4.0.



1. Overview (What is this policy about?)

This policy is intended to assist with the reduction in fatal and non-fatal pulmonary embolism and reduce the incidence of deep vein thrombosis in patients admitted to hospital through the effective use of thromboprophylaxis.

If you have any concerns about the content of this document please contact the author or advise the Document Control Administrator.

2. Scope (Where will this document be used?)

- All practitioners involved in the admission and in a patients routine care in patients at Bury and Rochdale, Oldham and North Manchester Care organisation.
- All practitioners involved in the admission and routine care of patients undergoing any day case surgical procedures under general or local anaesthesia.
- All practitioners involved in the outpatient management of patients of high risk of venous thromboembolism.
- For in-patients 16 years and above

Associated Documents

- For Obstetrics Patients please refer to, CPWC106, Guidelines for Thromboprophylaxis in Obstetrics
- Guidelines for the Diagnosis and Management of Deep Vein Thrombosis and Pulmonary embolism in Adult Inpatients and outpatients, CPSU067
- Thromboprophylaxis in ambulatory Trauma/Orthopaedics Outpatients with Temporary Immobilisation, CPSU091
- National Institute for Health and Clinical Excellence. Venous thromboembolism in over 16's – reducing the risk of hospital acquired deep vein thrombosis or pulmonary embolism. Clinical Guideline 89. March 2018. www.nice.org.uk/guidance/ng89

3. Background (Why is this document important?)

- Approximately 25,000 people in England each year, die from venous thromboembolism (VTE) contracted in hospital.
- Up to 40% of patients undergoing major surgery do not receive effective prophylaxis
- In addition, 40% of medical patients who are eligible for preventative treatment do not receive effective prophylaxis

4. What is new in this version?

- Significant changes in policy content to update in line with NICE Guidelines 2018, NG89
- Updated in line with electronic risk assessment
- Updates to mechanical thromboprophylaxis forms
- Update to HAT criteria, VTE review forms and unavoidable HAT criteria

5. Policy

5.1 Process for Identifying Patients at Risk of VTE

5.1.1 Risk Assessment of VTE at the time of initial admissions and subsequent stay in the hospital.

- All patients admitted to Bury and Rochdale, Oldham and North Manchester Care Organisation should have a VTE risk assessment completed on admission.
- All patients both medical and surgical (aged 16 years and above) admitted to hospital either as inpatients or as day-case procedures must undergo a full documented venous thromboembolism risk assessment on admission in order to identify those who are at increased risk of VTE.
- This assessment forms the basis of decision making for prescription of pharmacological or mechanical thromboprophylaxis
- Currently the assessment is made on the clerking proforma or the specified VTE assessment sheet but will be superseded when the electronic assessment of VTE is rolled out across the Bury and Rochdale, Oldham and North Manchester Care organization.
- The initial assessment should be verified within 24 hours of admission by a senior member of the responsible clinical team to validate or reassess initial decision making
- The VTE assessment should further be repeated whenever the clinical situation changes or if the patient is staying for a long term to be reviewed on a weekly basis to confirm the accuracy.
- It is also recommended as a good practice point that a VTE assessment should be repeated whenever a patient is transferred from one ward to another ward.

5.1.2 Completion of VTE Risk Assessment

- The VTE assessment should be completed fully initially by the doctor or any other healthcare practitioner completing the clerking/admissions document on admission for all patients admitted within the care organisation.

- Box 1 which contains risk factors for developing VTE and Box 2 which contains risk factors for bleeding should be completed appropriately in every patient

- The VTE risk assessment should guide the decision making as to whether thromboprophylaxis is required, contraindicated or deemed unnecessary/inappropriate.

- When VTE thromboprophylaxis is required, the decision has to be made whether the VTE prophylaxis has to be pharmacological and/or mechanical depending on the situation by the admitting team.

- The contraindications checklist has to be completed both for mechanical and pharmacological thromboprophylaxis as appropriate in each clinical situation

- VTE assessment is not mandatory for patients admitted to intermediate care beds.

- It is good clinical practice that VTE risk assessment is done at the point of admission, at 24 hours post admission, then weekly and also whenever the clinical situation changes

Examples supporting re-assessment:

1. Ambulatory patients admitted for a minor illness who deteriorate and become bed bound for more than 3 days.

2. Patient should not be prescribed pharmacological prophylaxis due to a high risk procedure who has now had the procedure (or the procedure is cancelled) and no longer has the contraindications.

3. Patient suffering a significant bleed during hospital admission.

4. Patient who has returned to baseline mobility and the risk factors for VTE

Box 1 Risk Factors for VTE

- Active Cancer or cancer treatment
- Age 60 years and over
- Critical Care Admission
- Dehydration
- Known thrombophilia
- Obesity (BMI ≥30kg/m2)
- Personal or family history of VTE
- Oestrogen containing contraceptive therapy
- Hormone replacement therapy
- Varicose veins with phlebitis
- One or more significant medical co-morbidities (for example heart disease; metabolic, endocrine or respiratory pathologies; acute infectious diseases; inflammatory conditions
- For women who are pregnant or given birth within the previous 6 weeks see Obstetric guidance (CPWC106)

Box 2 Risk Factors for Bleeding

- Acute bleeding or risk of bleeding
- Significant head/spine/ocular trauma
- Haemorrhagic stroke in the past month
- Platelet count <75 x 10^9
- Uncontrolled hypertension ≥230/120mmHg
- International normalised ration (INR)>2
- Past medical history of Heparin Induced thrombocytopaenia (HIT) or heparin sensitivity
- Bacterial endocarditis (discuss with cardiologist)

5.2 Thromboprophylaxis

5.2.1. Mechanical thromboprophylaxis

- If Mechanical thromboprophylaxis is considered appropriate following VTE risk assessment the preferred options are either anti-embolic stockings (AES) or intermittent pneumatic compression (IPC) devices.

- If someone is selected for the anti-embolic stockings (AES) or intermittent pneumatic compression (IPC) devices then the section on contraindications on the VTE assessment form should be completed before prescription of these agents for thromboprophylaxis.

- They are not recommended routinely for medical patients but may be used where there are contraindications for clinical thromboprophylaxis at the discretion of the treating clinician.

5.2.2 Anti-Embolic Stockings (AES)

- Anti-embolic stockings (AES) are recommended for all emergency surgical admissions, all elective cases with a combined anaesthetic and surgical time of more than 90 minutes and any surgical patient with one or more recognised venous thromboembolism risk factor.

- The stocking compression should be approx. 18mm Hg at the ankles and 14mm Hg at the mid-calf.

There are a number of contraindications to anti-embolic stocking placement which are:

1. Peripheral Arterial or Vascular Disease
2. Peripheral Arterial Bypass Grafting
3. Neuropathy Disease
4. Local leg condition interfering with stocking (dermatitis, gangrene, recent skin graft, skin lesions)
5. Cellulitis (until pain and inflammation resolving)
6. Leg oedema secondary to cardiac failure
7. Gross oedema of the leg
8. Extreme leg deformity
9. Blistering, marking or skin discolouration, particularly over heels and bony prominences
10. Known allergy to material
11. Ankle circumference greater than 35 cm
12. Absent pedal pulses
13. Patient admitted with Stroke
14. Patient Refusal
15. Use clinical caution when applying over ulcers wounds

- Where the risk assessment indicates that anti-embolic stockings (AES) should be used, but they are contraindicated by other factors this should be documented on the VTE assessment form.

- Please follow AES care pathway (appendix 4) and integrated care pathway for application of AES (appendix 5)

- **Anti-embolic stockings (AES) should not be used by patients admitted with stroke.**

- AES should be fitted and patients shown how to use them by staff trained in their use

5.2.3 Intermittent pneumatic compression (IPC) devices

- Intermittent pneumatic compression (IPC) device can be used as an alternative to anti-embolic stockings(AES)

- Intermittent pneumatic compression (IPC) devices are first line in stroke patients and also in patients with critical illnesses.

- IPC devices should be prescribed on the electronic prescription for those patients who require them as means of mechanical thromboprophylaxis.

- Where risk assessments indicate that IPC devices should be used but are contraindicated by other risk factors or refusal by the patients this should be documented.

- Decision to apply IPC devices by a patient undergoing surgery is always a clinical decision. This should be taken by the relevant clinical team after evaluating the risks and benefits. The contraindications for IPC devices should be noted on the VTE risk assessment before the prescription of IPC for mechanical thromboprophylaxis.

- There are a number of contraindications to IPC which are:
    1. Suspected or Known DVT
    2. Noradrenaline
    3. Peripheral Arterial or Vascular disease
    4. Peripheral Arterial Bypass Grafting
    5. Absent pedal pulses
    6. Peripheral neuropathy or other causes of sensory impairment
    7. Lower leg deformity
    8. Excessive calf size
    9. Any other cause preventing safe application
    10. Oedema secondary to cardiac failure
    11. Known allergy to material
    12. Pulmonary Embolism
    13. Any local leg condition in which the garments would interfere, including gangrene, recent skin graft, dermatitis, untreated infected leg wounds, cellulitis.
    14. Blistering, marking or skin discolouration, particularly over bony prominences
    15. Use clinical caution/judgement when applying over ulcers or wounds

5.3 Pharmacological thromboprophylaxis

- If Pharmacological thromboprophylaxis is considered appropriate following VTE risk assessment low molecular weight heparin (LMWH) Enoxaparin is the pharmacological prophylaxis offered for VTE in Bury and Rochdale, Oldham and North Manchester Care Organisation and should be commenced within 14 hours of admission unless contra-indicated

- If Enoxaparin or other LMWH are contraindicated then please liaise with Haematologist for other pharmacological agent for VTE thromboprophylaxis.

- Consider anti-embolic stockings (AES) or intermittent pneumatic compression (IPC) devices in these groups of patients.

5.3.1. Patients with kidney disease/renal impairment

- For patients with Kidney disease/Renal impairment offer LMWH Enoxaparin at a dose of 20mg subcutaneous once a day if eGFR is <30ml/min (Note: Enoxaparin is unlicensed for use with an eGFR of <15ml/min).

- If the balance of risks and benefits is against the use of Enoxaparin in these cohorts, consider the use of unfractionated heparin (5000 units subcutaneously twice a day) may be considered as an alternative as this has the advantage of shorter half-life and potential reversibility.

- If it was decided that the risks of pharmacological prophylaxis outweigh the benefits, shared decision making involving the patient and family to omit the prophylaxis has to be documented in VTE risk assessment forms as well as in the clinical notes.

5.3.2 Bleeding consideration with Pharmacological thromboprophylaxis

- Bleeding rates overall with prophylactic dose anticoagulation's are very low. Current evidence in general medically ill or surgical patients suggests a major bleeding rate of approximately 0.19% (1/500) and the clinically relevant non bleeding rate of approximately 1.9% (1:50).

- However certain patients will have individualised risks that warrant caution with prescription or temporary omission which needs to be clearly documented.

5.3.3 Absolute contraindication to Low Molecular weight Heparin prescription:

- Significant active bleeding from any site

- Thrombocytopenia (Platelets <50)

- Hypersensitivity to LMWH Heparin or heparin compounds

- Previous confirmed evidence of heparin induced thrombocytopenia

5.3.4 Conditions known to increase bleeding risks with Low Molecular Weight Heparin/cautions

- Acquired bleeding disorder (such as liver failure with INR of >1.5)

- Acute Stroke (within the last 4 weeks)

- Severe uncontrolled hypertension with Blood pressure of >230/120 mmhg

5.3.5 Time sensitive contraindications

- Low Molecular Weight Heparin should not be given within the 2 hours before epidural or spinal anaesthesia.

- Low Molecular Weight Heparin should not be given for 6 hours after insertion or removal of epidural catheters or 6 hours after spinal (lumbar close puncture).

5.3.6 Patient information for Pharmacological thromboprophylaxis

- Low molecular weight heparins are porcine derivatives. This information should be conveyed to patients where relevant and in particular the patients of Muslim or Jewish faith or those who follow a Vegan diet.

- Fondaparinux can be considered as an alternative in these situations although experience of this agent is limited especially in severe renal impairment (eGFR<30).

5.4 Patient groups and additional considerations:

5.4.1 VTE prophylaxis in the intermediate care setting within the Care organisation:

Persons admitted to intermediate care facility within the care organisation aren't required to follow this prevention policy. However, if a person has been transferred to intermediate care facility for a period of rehabilitation after orthopaedic surgery and who are at high risk of VTE should have appropriate VTE prophylaxis prescribed whilst in the intermediate care setting. It is good medical practice to assess VTE risk for each individual admitted to this facility and decide on VTE prophylaxis as necessary

5.4.2 Young people under the age of 18:

Young people admitted to wards between the ages of 16 to 18 years should have a VTE assessment risk completed at the time of admission as for any other persons. If they are deemed to be at high risk for VTE then consider pharmacological VTE prophylaxis as for people aged over 18 years. The prescriber should choose appropriate pharmacological VTE prophylaxis according to the conditions as described in the policy for adults, however, the prescriber should be cautious. The medications which are recommended for people over the age of 18 years namely Apixaban, Aspirin, Dabigatran Etexilate, Fondaparinux sodium, Low-molecular-weight heparin (LMWH) and Rivaroxaban do not have a UK marketing authorisation for use in young persons under the age of 18 years. The prescriber should take responsibility for the decision taking into account Good Medical practice and should get informed consent for the use of these medications after discussion with the person and family or carers which should be documented clearly in the notes.

5.4.3 Risk Assessing and prescribing when ePMA unavailable

VTE assessments are required to be undertaken at the point of admission, at 24 hours post admission, then weekly and also whenever the clinical situation changes using the paper version of the VTE assessment (appendix 2). After completion of the VTE assessment prescribing thromboprophylaxis where indicated should then be completed on paper inpatient prescription charts.

5.4.4 General medical patients:

- Offer pharmacological venous thromboprophylaxis to general medical patients.

- All general medical patients should have a VTE risk assessment documented at the initial assessment and verified by a senior clinician within 24hours of hospital admission.

- Medical patients should be recorded of being at increased risk of VTE if they have or expect to have significant reduction in mobility for more than 3 days or expecting to have ongoing reduced mobility relative to their normal state and have one or more specific recognised risk factors of VTE.

- Offer pharmacological VTE Prophylaxis to general medical patients assessed to be at risk of VTE as soon as possible after the risk assessment has been completed.

- When a patient is deemed to be at risk of VTE but not suitable for pharmacological VTE prophylaxis, consider mechanical thromboprophylaxis which can be used at the discretion of the treating clinician.

5.4.4.1 Elderly frail patients:

- Elderly patients should be managed as per medical admissions in relation to VTE prophylaxis, however, it would be worthwhile to note British Geriatric Society best practice guidance which are as follows:

    1. Many older patients are confused either from delirium or dementia and will not be able to consent to treatment. Thus the treating clinician should assume the responsibility of making the best interest detriment on the value of treatment on behalf of the patient after discussion with patient carers and advocates if available.

    2. The skin in older people is frequently more fragile and easily bruised. Older people are properly more likely to suffering from local bruising and minor haemorrhages of the injection site or the use of anti-embolic stockings. This may cause pain and discomfort in a patient that is perhaps unable to understand the reason for the treatment and this may undermine rehabilitation.

    3. Some patients who are near end of life where their admission and treatment have goals of relevant symptoms are not necessarily prolonging life. For these patients injections for thromboprophylaxis may be an additional unwelcomed burden.

    4. Patients who are usually immobile do not require thromboprophylaxis unless they have additional illnesses.

    5. Patients who are at risk of multiple falls will have an enhanced risk of bruising from pharmacological thromboprophylaxis.

    6. Mortality risk from pulmonary embolism and from major haemorrhages are both increased in older people.

- After consideration of these issues the risk and balance of mechanical and pharmacological thromboprophylaxis may be deemed to outweigh the benefits.

- However the clinician in charge of these patients has the duty to ensure non-ageist practice and all patients still require VTE risk assessments on admission to hospital.

- If the decision to omit thromboprophylaxis is made this should be recorded during the reviews and also if the burden of treatment outweigh the benefits then the management decision should be documented clearly in the notes.

5.4.5. Patients with Stroke

- There are significant risks of venous thromboembolism in immobile stroke patients while in the hospital.

- Do not offer anti-embolic stocking (AES) as mechanical thromboprophylaxis for patients who are admitted with a stroke.

- Intermittent pneumatic compression (IPC) devices should be used first line for thromboprophylaxis for patients admitted with a stroke and must be prescribed at the time of the initial assessment.

- IPC devices have been clearly shown to reduce the incidents of DVT at 30 days (8.5% vs 12.15).

- IPC devices should be provided for patient with acute ischemic or haemorrhagic stroke as soon as possible and within 72 hours of being in hospital.

- Treatment with IPC devices should be continued for 30 days or until patient becomes independently mobile (requires no manual assistance to transfer from bed and mobilises to the toilet) or is discharged, whichever is sooner.

- Where patients are reluctant to wear IPC devices or lack capacity to agree to IPC devices the patient's capacity in relation to IPC devices should be recorded and risk benefit discussions with the patient, family and carers or the best person as appropriate should be documented

- Re-assess weekly the risk of VTE and bleeding in people with acute stroke who are not able to tolerate IPC or when IPC is contraindicated within the first 28 days and consider pharmacological prophylaxis if the risk of VTE outweighs the risk of bleeding.

- The contraindication of IPC should be documented on the VTE assessment form before prescription of IPC

- The contraindications for wearing IPC devices are as follows:

    1. Suspected or Known DVT
    2. Noradrenaline
    3. Peripheral Arterial or Vascular disease
    4. Peripheral Arterial Bypass Grafting
    5. Absent pedal pulses
    6. Peripheral neuropathy or other causes of sensory impairment
    7. Lower leg deformity
    8. Excessive calf size
    9. Any other cause preventing safe application
    10. Oedema secondary to cardiac failure
    11. Known allergy to material
    12. Pulmonary Embolism
    13. Any local leg condition in which the garments would interfere, including gangrene, recent skin graft, dermatitis or untreated, infected leg wounds, cellulitis
    14. Blistering, marking or skin discolouration, particularly bony prominences
    15. Use clinical caution/judgement when applying over ulcers or wounds

Pharmacological Prophylaxis (LMWH) in stroke patients

- The evidence for the use of LMWH in haemorrhagic stroke is limited and inconclusive.

- However it is recommended that prophylactic anticoagulation with low molecular weight heparin should be considered in immobile patients with a stroke where the benefits of reducing the risk of venous thromboembolism is high enough to offset the increased risk of intracranial and extracranial bleeding associated with LMWH use.

- Consider offering prophylactic dose of low molecular weight heparin when
    1. Haemorrhagic stroke has been excluded
    2. The risk of bleeding (Haemorrhagic transformation of ischaemic stroke of bleeding into another site) is known to be low
    3. The patient has major restriction of mobility, previous history of VTE, dehydration and other comorbidities.

5.4.6. Patients With Cancer

- Consider pharmacological VTE prophylaxis if they are assessed to be at increased risk of VTE.

- Consider pharmacological VTE prophylaxis with LMWH for people with myeloma who are receiving chemotherapy with thalidomide, pomalidomide or lenalidomide with steroids.

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

- If patients with cancer receive VTE prophylaxis they should continue it as long as they are receiving chemotherapy.

- 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 in special situations as mentioned above and they are also at increased risk of VTE due to something other than the cancer.

5.4.7. Patients receiving palliative care

- Consider pharmacological VTE prophylaxis for patients who are having palliative care taking into account temporary increases in thrombotic risk factors, risk of bleeding, likely life expectancy and the views of the person and the family, members or carers.

- Use Low Molecular Weight Heparin as a first line treatment.

- If low molecular weight heparin is contraindicated consider Fondaparinux sodium.

- Do not offer VTE prophylaxis to people in the last days of their lives.

- Review VTE prophylaxis for people who are having palliative care taking into account the views of the person, the family members or carers and the multidisciplinary team.

5.4.8. Patients admitted to the Critical Care unit

- Assess all patients admitted to the Critical care Unit for risk of VTE and bleeding.

- Provide Low Molecular Weight Heparin to patients admitted to the critical care unit if pharmacological VTE prophylaxis is not contraindicated.

- Consider low dose enoxaparin in patients who have renal impairment with eGFR <30ml/min.

- Consider mechanical thromboprophylaxis for patients admitted to the Critical Care Unit if pharmacological VTE prophylaxis is contraindicated based on the condition or procedure.

- If there are contraindications for mechanical thromboprophylaxis this should be documented.

- Reassess VTE and bleeding risk daily for people in the Critical Care Unit

- Assess VTE and Bleeding risk more than once in patients admitted to the Critical Care Unit if the person's condition is changing rapidly.

5.4.9. Patients with simple venous catheters

- Consider offering pharmacological VTE prophylaxis to patients with simple venous catheters who are at increased risk of venous thromboembolism form the initial assessment.

- Do not routinely offer pharmacological or mechanical prophylaxis to patients who have central venous catheter and who are ambulant.

5.4.10. Surgical patients

5.4.10.1 Thromboprophylaxis in elective surgical admissions:

Unless the surgical procedure is planned awake and under local anaesthetics VTE risk assessment should be carried out for all surgical patients on the day of surgery

5.4.10.2 Surgery with local anaesthesia

Patients listed for procedures under local anaesthesia with or without sedation still require a VTE assessment but may not require thromboprophylaxis of any kind provided they remain at baseline mobility status following surgery

5.4.10.3. Surgery with general/regional anaesthesia

- All patients who undergo surgical procedure with accompanying anaesthetic and surgical procedure of more than 90 minutes or 60 minutes if the surgery involves the pelvis or lower limb should be considered at risk of venous thromboembolism.

- All day case surgical patients should be provided with fitted AES or IPC devices on admission by nursing staff. The only exceptions to these include:

    1. Elective day case patients with no recognised VTE risk factors and a predicted surgical/anaesthetic time of less than 60 minutes

    2. Specific contraindications to AES and IPC devices exist.

    - Specific day case indications to consider IPC devices over anti-embolic stockings are as follows:

        1. Patients in whom mechanical thromboprophylaxis is indicated but has definite contraindication to anti-embolic stockings.

        2. Patients with a high risk of bleeding in the post-operative period where pharmacological VTE prophylaxis could be delayed.

        3. Patients with planned admission to level 2 or level 3 Critical Care area.

        4. Patients having a procedure under general/regional anaesthesia and listed time of more than 90 minutes.

- All patients remaining are likely to remain in hospital for more than 2 hours and who are being assessed as being at high risk of VTE with a low bleeding risk should be prescribed low molecular weight heparin enoxaparin.

- Low molecular weight heparin should be given 6 -12 hours post-operatively unless a clear plan is documented by the responsible operating surgeon.

- All patients should have thromboprophylaxis continued daily until discharge or until they no longer have significant reduced mobility.

5.4.10.4. Abdominal surgery

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

- Commence mechanical thromboprophylaxis on admission for people undergoing abdominal surgery with either AES or IPC devices.

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

- Add pharmacological VTE prophylaxis with LMWH Enoxaparin 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

- Extend pharmacological VTE prophylaxis to 28 days postoperatively for people who have had major cancer surgery of the abdomen.

- Use mechanical and pharmacological VTE prophylaxis with LMWH Enoxaparin for a minimum of 10 days for people undergoing Gynaecological surgery over 60 minutes whose risk of VTE outweighs their risk of bleeding, taking into account individual patient factors and according to clinical judgement

5.4.10.5. Oral and maxillofacial Surgery

- 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.

- Mechanical thromboprophylaxis with either AES or IPC device on admission for people undergoing oral or maxillofacial surgery who are at increased risk of VTE and high risk of bleeding.

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

5.4.10.6. ENT Surgery

- 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 risks of bleeding.

- Mechanical thromboprophylaxis with either AES or IPC device on admission for people undergoing ENT surgery who are at increased risk for VTE and have high risk of bleeding.

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

5.4.10.7. People with major trauma

- People presenting with serious or major trauma should be offered mechanical thromboprophylaxis with IPC devices provided there are no contraindications.

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

- Regular reassessment of VTE risks and bleeding risks in people with serious or major trauma whenever their clinical condition changes and at least once a day.

- 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. Pharmacological VTE prophylaxis should be continued for a minimum of 7 days.

5.4.10.8. Orthopaedic Surgery

5.4.10.8.1 Lower limb immobilisation

- Pharmacological VTE prophylaxis with LMWH should be considered for people with lower limb immobilisation if the risk of VTE outweighs their risk of bleeding.

- Consider stopping prophylaxis if lower limb immobilisation continues beyond 42 days.

5.4.10.8.2. Fragility fractures of the pelvis, hip and proximal femur

- People with fragility fractures of the pelvis, hip or proximal femur should be offered VTE prophylaxis for a month if the risk of VTE outweighs the risk of bleeding.

- Consider LMWH Enoxaparin 6-12 hours after surgery

- Pre-operative VTE prophylaxis should be considered for people with fragility fractures of the pelvis, hip or proximal femur if the surgery is delayed beyond the day after admission. The last dose for LMWH should be given no less than 12 hours before surgery.

- Consider IPC devices 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

5.4.10.8.3. Elective hip replacement surgery

- People undergoing elective hip replacement surgery should be offered VTE prophylaxis if their risk of VTE outweighs their risk of bleeding.

The choices for pharmacological thromboprophylaxis are as follows:

1. LMWH for 10 days followed by Aspirin (75 mg or 150 mg) for a further 28 days.

2. LMWH for 28 days combined with AES until discharge

3. One of the three DOACS – Rivaroxaban or Apixaban or Dabigatran can be used for prevention of VTE in adults having elective total hip replacements

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

5.4.10.8.4. Elective knee replacement surgery

People undergoing elective knee replacement surgery should be offered VTE prophylaxis if their risk of VTE outweighs their risk of bleeding.

The choices for pharmacological thromboprophylaxis are as follows:

1. Asprin (75mg or 150 mg) for 14 days

2. LMWH for 14 days combined with AES until discharge

3. One of the three DOAC's – Rivaroxaban or Apixaban or Dabigatran can be used for prevention of VTE in adults having elective total hip replacements as recommended in NICE technology appraisal guidance.

- Consider IPC device if pharmacological interventions are contraindicated in people undergoing elective knee replacement surgery. Continue until the person is mobile.

5.4.10.8.5 Non-arthroplasty orthopaedic knee surgery

- VTE prophylaxis is generally not required for people undergoing arthroscopic knee surgery where the total anaesthesia time is less than 90 minutes and the person is at low risk of VTE.

- LMWH should be considered as pharmacological prophylaxis 6–12 hours after surgery for 14 days for people undergoing arthroscopic knee surgery if the total anaesthesia time is more than 90 minutes or the person's risk of VTE outweighs their risk of bleeding.

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

5.4.10.8.6. Foot and ankle orthopaedic surgery

- pharmacological VTE prophylaxis for people undergoing foot or ankle surgery in these situations

1. Person requires immobilisation (for example, arthrodesis or arthroplasty)

2. when the total anaesthesia time is more than 90 minutes

3. when the person's risk of VTE outweighs their risk of bleeding.

- Consider stopping prophylaxis if immobilisation continues beyond 42 days

5.4.10.8.7. Upper limb orthopaedic surgery

- Generally VTE prophylaxis is 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.

5.4.10.9 Vascular surgery

5.4.10.9.1. Endovascular repair and Open vascular surgery

- Consider pharmacological thromboprophylaxis with LMWH for a minimum of 7 days for patients undergoing open vascular surgery or major endovascular procedures including endovascular aneurysm repair whose risk of VTE out ways the risk of bleeding.

- Consider mechanical VTE prophylaxis on admission for people who are undergoing open vascular surgery or major endovascular procedures. If pharmacological prophylaxis is contraindicated in this group then consider AES or IPC devices.

- Continue mechanical thromboprophylaxis until there is no longer a significantly reduced mobility related to the normal mobility.

5.4.10.9.2. Lower limb amputation

- 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.

- Consider mechanical thromboprophylaxis with IPC device 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 thromboprophylaxis until the person no longer has significantly reduced mobility relative to their anticipated mobility.

5.4.10.9.3. Varicose vein surgery

- VTE prophylaxis is generally not needed for people undergoing varicose vein surgery where the total anaesthesia time is less than 90 minutes and the person is at low risk of VTE.

- Consider pharmacological VTE prophylaxis with LMWH starting 6–12 hours after surgery and continuing for 7 days for people undergoing varicose vein surgery if the total anaesthesia time is more than 90 minutes or the person's risk of VTE outweighs their risk of bleeding.

- Consider mechanical thromboprophylaxis with AES, on admission, for people undergoing varicose vein surgery who are at increased risk of VTE where pharmacological prophylaxis is contraindicated.

- When using AES for people undergoing varicose vein surgery, continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.

5.5 Heparin Induced Thrombocytopenia (HIT):

- Patients who are to receive any heparin must have a baseline platelet count taken prior to initial dose of LMWH being given.

- The risk of heparin induced thrombocytopenia (HIT) is low and therefore routine platelet monitoring is not required other than those patients undergoing (cardiopulmonary bypass) Watson et al (2012).

- However if a patient develops any signs & symptoms of HIT in the first 4 to 14 days of heparin administration then clinical assessment must be made and LMWH must be stopped.

- In the absence of monitoring, patients need to be informed of the signs & symptoms of heparin induced thrombocytopenia.

- In patients with suspicious or confirmed diagnosis of HIT, heparin should be stopped and the patient should be treated with Danaparoid or Argatroban after discussion with the haematology team.

- Therapeutic dose Fondaparinux is an acceptable alternative anticoagulant for managing HIT but is not licensed for this indication. Patients should be therapeutically anti-coagulated for 3 months after HIT with a thrombotic complication and for 4 weeks following HIT without thrombotic complication.

5.6 Patient Information

On admission healthcare professionals must provide patients with both verbal and written information on the following:

- Reducing the risk of a blood clot during and after your stay in hospital. PI_SU_393

- The signs and symptoms of DVT and PE.

- The correct use of prophylaxis (for example, anti-embolic stockings, and intermittent pneumatic compression devices)

- How patients can reduce their risk of VTE (such as keeping well hydrated and if possible exercising and becoming more mobile)

- **Discharge Planning**

    - As part of the discharge plan, offer patients and/or their families or carers verbal or written information on:
        - The signs and symptoms of a deep vein thrombosis or pulmonary embolism
        - The correct and recommended duration of VTE prophylaxis at home (if discharged with prophylaxis)
        - The importance of using VTE prophylaxis correctly and continuing treatment for the recommended duration (if discharged with prophylaxis)
        - The signs and symptoms of adverse events related to prophylaxis (if discharged with prophylaxis)
        - The importance of seeking help and who to contact if they have any problems using prophylaxis (if discharged with prophylaxis)
        - The importance of seeking medical attention if deep vein thrombosis, pulmonary embolism is suspected after discharge from hospital.

- Notify the patients GP if the patient is to be discharged home on pharmacological prophylaxis.

5.7 Root Cause analysis and incident reporting

- All diagnosis of VTE should be routinely screened to categorise and investigate cases of hospital acquired thrombosis.
- This is performed to facilitate shared learning, quality improvement and promoting best practice.
- Hospital acquired thrombosis is defined by NHS England as deep vein thrombosis or pulmonary embolism which occurs during inpatient stay, in a patient who's had a hospital admission in the preceding 90 days or had a bed provided for a procedure as a day patient.
- Root cause analysis (RCA) should be completed on all cases of hospital acquired thrombosis to investigate whether thromboembolism risk assessment have been appropriately completed and whether thromboprophylaxis has been prescribed in a timely manner and delivered reliably.
- RCA of these cases should fall to independent and multidisciplinary divisional teams.
- All cases of hospital acquired thrombosis should be deemed preventable if the trust policy has not been followed as an adverse incident with preventable harm.
- All RCA episodes will be cascaded to divisional governance team to share the learning and analytic analysis.

- Every patient admitted to the trust should have VTE assessment completed on admission and verified by senior clinician within 24 hours.

- VTE risk assessment should be repeated whenever the clinical scenario changes significantly and at a weekly minimum at the absence of clinical change.

- All patients should be prescribed and administered thromboprophylaxis either pharmacological or mechanical as appropriate to the risk assessment. If a person is not suitable for either pharmacological or mechanical thromboprophylaxis these should be clearly documented along with documentation of shared decision making in consultation with patients, family and carers.

- All patients who have suffered hospital or surgical thrombosis will have an RCA completed.

- Any hospital acquired thrombosis episodes deemed potentially preventable after RCA to be classed at preventable harm.

6. Roles & responsibilities

6.1 Role 1

The VTE Committee

- Ensuring that policies are in line with national VTE guidance
- Coordinating the implementation of the policy
- Ensuring access to training
- Monitoring audit of compliance
- Review all cases of VTE and associated root cause analyses

6.2 Role 2

Thromboprophylaxis Nurse

- Provide clinical and professional leadership within the specialist area
- Develop and support a VTE training programme
- Undertake audit projects with the support of clinical audit to monitor and evaluate the adherence to Trust protocol
- Gather and provide data on hospital acquired VTE's
- Initiate investigation of hospital acquired VTE's using RCA form (Appendix 8) and VTE criteria (Appendix 9). Incident report avoidable hospital acquired VTE's using the trust incident reporting system.

6.3 Role 3

Named Consultant

- Responsible for ensuring compliance with the policy for their patients
- Responsible for ensuring their patients are correctly assessed and re-assessed for their risk of VTE
- Responsible for checking their patients have the correct dose of VTE prophylaxis prescribed during ward rounds
- Responsible for the review of patient care when incidents relating to VTE are generated

6.4 Role 4

All Ward Managers and Departmental Managers

- Ensuring attendance/completion of VTE training for staff
- Ensuring sufficient stocks of Anti Embolic Stockings are available when required
- Ensuring patient leaflets for reducing the risk of a blood clot and Anti-embolism Stockings are available on ward
- Ensuring supply of VTE risk assessment are available on ward
- Responsible for the review of patient care when incidents relating to VTE are generated.

6.5 Role 5

Nursing Staff

- Ensuring each patient has a completed VTE risk assessment
- Assessment and application of mechanical VTE prophylaxis (anti embolic stockings, foot impulse devices, intermittent pneumatic compression devices).
- Provision of verbal/written information on, reducing the risk of a blood clot during and after you stay in hospital (Leaflet Code PI_SU_393)
- Ensuring patients, families, carers are competent to administer prophylaxis on hospital discharge as necessary.
- Ensuring attendance/completion of VTE training

Role 6.6 Role 6

Junior Doctors

- Ensuring attendance/completion of VTE training
- Responsible for risk assessing/reassessment of all patients and prescribing correct prophylaxis
- Responsible for prescribing appropriate prophylaxis, including chemical and mechanical, and re- assessing and reviewing prophylaxis as the patient's medical condition changes.
- Ensure that VTE prevention is high priority in the day to day management of their patients.
- To complete the VTE section of the Automated Letter System (ALS) discharge letter.

Role 6.7. Role 7

Pharmacists

The Pharmacist will review the patients VTE risk assessment as part of their clinical check and will ensure that the patient is prescribed the appropriate thromboprophylaxis where indicated. If there is no evidence that a VTE risk assessment has been completed, they will bring this to the attention of the medical / nursing staff looking after the patient.

7. Monitoring document effectiveness

Key standards:

- NICE VTE Standards
- NHS Standard Contract with regard to VTE

Methods:

- Review of incident forms and RCA's
- Spot checks undertaken by pharmacist and/or VTE nurse
- Monitoring of mandatory training
- Action plans are developed and implemented to ensure that lessons are learnt following incidents relating to this policy

Team responsible for monitoring:

- Clinical nursing staff and ward managers
- Pharmacy staff
- VTE Committee
- VTE Nurse
- Group Risk and Assurance Committee
- Directorate management teams if recurrent issues
-

Frequency of monitoring:

- Monthly through the review of RCA's and incident forms

- Regularly through audits

Process for reviewing results and ensuring improvements in performance:

- Monthly figures identifying number of hospital acquired VTE's reported to VTE Committee and leads at each care organisation.
- Monthly figures and VTE's identified as avoidable reported into VTE Committee
- Hospital VTE's reported through the incident reporting system reviewed by VTE leads at each care organisation.

8. Abbreviations and definitions

AES	Anti Embolic Stockings
ALS	Automated Letter System
BMI	Body Mass Index
CCF	Congestive Cardiac Failure
CG	Clinical Guideline
CQUIN	Commissioning for Quality and Innovation
DOAC	Direct Oral Anticoagulant
DVT	Deep Vein Thrombosis
EGFR	Estimated Glomerular Filtration Rate
ENT	Ear, Nose & Throat
EPMA	Electronic Prescribing and Medicine Administration
GP	General Practitioner
HIT	Heparin Induced Thrombocytopenia
HRT	Hormone Replacement Therapy
INR	International Normalised Ratio
IPC	Intermittent Pneumatic compression
LMWH	Low Molecular Weight Heparin
NHS	National Health Service
NICE	National Institute of Clinical Excellence
PE	Pulmonary Embolus
RCA	Root Cause Analysis
VTE	Venous Thromboembolism

9. References

References;

1. Agu O, Hamilton G, Bake D (1999). Graduated compression stockings in the prevention of venous thromboembolism. British Journal of Surgery 86 pp 992-1004.

2. Keeling D, Davidson S, Watson H (2006). The Management of Heparin Induced Thrombocytopenia. British Society Haematology, p 259-269

Acknowledgement of sources

- National Institute for Health and Clinical Excellence. Venous thromboembolism in over 16's – reducing the risk of hospital acquired deep vein thrombosis or pulmonary embolism. Clinical Guideline 89. March 2018. www.nice.org.uk/guidance/ng89

- Prevention of Hospital Acquired thrombosis, Salford Royal NHS Foundation Trust. TC36)07), issue number: 6.2. Expires July 2019 (indefinite extension given).

10. Appendices

Appendix 1 Electronic risk assessment

VTE Risk Assessment Form

(PAHT VTE Policy) Click to access VTE Policy

Medical Patient ○	Surgical Patient ○
Exclude sections 3, 4 and 8	All sections of form

Q1. Is the patient expected to be immobile for three days or more OR is expected to have on-going reduced mobility relative to their normal state?	Yes ○	No ○
Q2. If yes, does this patient have acute stroke?	Yes ○	No ○

Prescribe intermittent pneumatic compression for VTE prophylaxis for people if there are no contraindications who are immobile and admitted with acute stroke for a maximum of 30 days or until the patient is mobile or discharged. If using, start it within 3 days of acute stroke. Please do not use anti embolic stockings for patients with acute stroke as it is contraindicated.

Q3. Is this acute surgical admission with inflammatory intra-abdominal condition?	Yes ○	No ○
Q4. Is patient expected to have reduced mobility post-operatively?	Yes ○	No ○

Q5. Patient related risk factors

☐	Age ≥ 60 years	☐	Active cancer or cancer treatment
☐	Dehydration	☐	Chemotherapy within last 6 weeks
☐	Known Thrombophilia	☐	Personal or family history of VTE
☐	Obesity (BMI ≥30kg/m^2)	☐	Pregnancy or ≤6 weeks post-partum
☐	Critical Care Admission	☐	Varicose Veins with Phlebitis
☐	Oral contraception/HRT	☐	Central veins with phlebitis
☐	One or more significant medical co-morbidities (i.e. heart disease; metabolic; endocrine; or respiratory pathologies; acute infectious diseases or inflammatory conditions.)	☐	Central venous catheter in-situ
☐	ICU		

Q6. Contra-indications to LMWH (Exclusion criteria)

☐	Acute bleeding or risk of bleeding	☐	Significant hear/spine/ocular trauma
☐	Haemorrhagic stroke in past month	☐	Platelet count <75 x 10^9
☐	Uncontrolled hypertension ≥230/120mmHg	☐	INR >2
☐	Past history of Heparin Induced Thrombocytopenia	☐	Past history with Heparin sensitivity
☐	Bacterial endocarditis (discuss with Cardiologist)	☐	On therapeutic dose LMWH
☐	Spinal/Epidural anaesthesia or lumbar puncture (last 4 or next 12 hours)	☐	Maximum dose LMWH 20mg if Creatinine Clearance ≤30ml/min
☐	Direct Oral Anti Coagulant		

Patient Name: FRED, VTETESTFOUR (MR)
NHS No: 156 433 4651
Page 1 of 3

Q7. Contra-indications to Compression Hosiery/ IPC

☐	Peripheral arterial or vascular disease	☐	Absent pedal pulses
☐	Lower leg cellulitis until pain & inflamation resolves	☐	Local leg conditions interfering with stocking (dermatitis, gangrene, recent skin graft, skin lesions)
☐	Lower leg deformity	☐	Peripheral neuropathy
☐	Pressure ulceration to heels/ foot	☐	Known allergies to stocking
☐	Patient on Noradrenaline	☐	If ankle circumference >35cm
☐	Leg oedema secondary to heart failure		

Q8. TYPE OF SURGERY, PROPHYLAXIS AND DURATION

Colour Codes:

☐ Red=Chemical prophylaxis +/- Mechanical

☐ Blue=Mechanical Prophylaxis

☐ Green=No prophylaxis

Q8.1 - Hip Surgery	Mechanical ☐ Chemical ☐
Please prescribe Extended 28 day prophylaxis	
Q8.2 - Elective hip replacement	Mechanical ☐ Chemical ☐
Please prescribe Extended 28 day prophylaxis (follow policy/see footnote) [1]	
Q8.3 - Total knee replacement	Mechanical ☐ Chemical ☐
Please prescribe Extended 14 day prophylaxis (follow policy/see footnote) [2]	
Q8.4 - Lower Limb Orthopaedic Surgery (total anaesthesia <60 min)	
a-With VTE risk factors	Mechanical ☐ Chemical ☐
Extended 1 week prophylaxis	
b-Without VTE risk factors	No specific prophylaxis ☐
Q8.5 - Lower limb Orthopaedic Surgery (total anaesthesia >60 min)	Mechanical ☐ Chemical ☐
Extended 1-2 week prophylaxis	

Patient Name: FRED, VTETESTFOUR (MR)
NHS No: 156 433 4651
Page 2 of 3

Q8.6 - Upper Limb Orthopaedic Surgery (total anaesthesia <90 min)	
a-With VTE risk factors	Mechanical (2 weeks) ☐
b-Without VTE risk factors	No specific prophylaxis ☐
Q8.7 - Upper limb Orthopaedic Surgery (total anaesthesia > 90 min)	Mechanical (2 weeks) ☐
Q8.8 - Below Knee Plaster of Paris	
a-With VTE risk factors	Mechanical ☐ Chemical ☐
b-Without VTE risk factors	No specific prophylaxis ☐
Q8.9 - Above Knee Plaster of Paris	Mechanical ☐ Chemical ☐
Q8.10 - Pelvic or Acetabular Trauma	Mechanical ☐ Chemical ☐
Extended 3 months prophylaxis	
Q8.11 - Head and Neck Surgery	Mechanical ☐ Chemical ☐
Fibula Flaps - No mechanical prophylaxis on operated leg	
Q8.12 - Non-Orthopaedic Surgery (Gastrointestinal/Urological/ENT etc)	Mechanical ☐ Chemical ☐
Extended prophylaxis for 7 days or until mobility is no longer significantly reduced provided risk of major bleeding is low	
Q8.13 - Vascular	Chemical (1 week) ☐
Q8.14 - Minor / Day Case	No specific prophylaxis ☐
Q9 - Timing of Assessment	
On Admission ○	
At 24 hrs post admission ○	
Weekly assessment / Change in condition ○	
Q10 - Information leaflet given to patient and carers on reducing risk of blood clots whilst in hospital: ☐	
Q11 - Prescribe prophylaxis anticoagulation as per clinical indications above, if no contraindications.	Yes ○ No ○
If No, please choose the reason:	Select Reason
If Other, document the reason:	
Q12 - Prescribe compression stocking, if no contraindications.	Yes ○ No ○
If No, document the reason:	
Patient Name: FRED, VTETESTFOUR (MR) NHS No: 156 433 4651	Page 3 of 3

1 – LMWH 28 day, Apixaban 32-38 days, Rivaroxaban 5 weeks

2 – LMWH 14 days, Apixaban 10-14 days, Rivaroxaban 2 weeks

Appendix 2 Paper Risk assessment

Saving lives, Improving lives

NHS
Northern Care Alliance
NHS Group

Salford | Oldham | Bury | Rochdale | North Manchester

Attach Patient Addressograph Label

Venous Thromboembolism
VTE Risk Assessment Form

Medical Patient ☐ Exclude section 3,4 and 8.	Surgical Patient ☐ All sections of form.

1–Is the patient expected to be immobile for three days or more OR is expected to have on-going reduced mobility relative to their normal state?	Yes ○	No ○
2–If yes, does this patient have acute stroke?	Yes ○	No ○
Prescribe intermittent pneumatic compression for VTE prophylaxis for people if there are no contraindications who are immobile and admitted with acute stroke for a maximum of 30 days or until the patient is mobile or discharged. If using, start it within 3 days of acute stroke. Please do not use anti embolic stockings for patients with acute stroke as it is contraindicated.		
3–Is this acute surgical admission with inflammatory intra-abdominal condition?	Yes ○	No ○
4–Is patient expected to have reduced mobility post-operative?	Yes ○	No ○

5–Patient related risk factors:

☐	Age ≥ 60 years	☐	Active cancer or cancer treatment
☐	Dehydration	☐	Chemotherapy within last 6 weeks
☐	Known Thrombophilia	☐	Personal or family history of VTE
☐	Obesity (BMI ≥ 30kg/m2)	☐	Pregnancy or ≤6 weeks post-partum
☐	Critical Care Admission	☐	Varicose Veins with Phlebitis
☐	Oral contraception/HRT	☐	Central veins with phlebitis
☐	ICU	☐	Central venous catheter in-situ
☐	One or more significant medical co-morbidities (i.e. heart disease; metabolic; endocrine; or respiratory pathologies; acute infectious diseases or inflammatory conditions.)		

6–Contra-indications to LMWH (Exclusion criteria)

☐	Acute bleeding or risk of bleeding	☐	Significant head/spine/ocular trauma
☐	Haemorrhagic stroke in past month	☐	Platelet count <75 x 10^9
☐	Uncontrolled hypertension ≥230/120mmHg	☐	INR > 2
☐	Past history of Heparin Induced Thrombocytopenia	☐	Past history with Heparin sensitivity
☐	Bacterial endocarditis (discuss with Cardiologist)	☐	On therapeutic dose LMWH
☐	Spinal/Epidural anaesthesia or lumbar puncture (last 4 or next 12 hours)	☐	Maximum dose LMWH 20mg if Creatinine Clearance ≤ 30ml/min
☐	Direct Oral Anti Coagulant		

7–Contra-indications to Compression Hosiery/ IPC

☐	Peripheral arterial or vascular disease	☐	Absent pedal pulses
☐	Lower leg cellulitis until pain & inflammation resolves	☐	Local leg conditions interfering with stocking (dermatitis, gangrene, recent skin graft, skin lesions)
☐	Lower leg deformity	☐	Peripheral neuropathy
☐	Pressure ulceration to heels/ foot	☐	Known allergies to stocking
☐	Patient on Noradrenaline	☐	Ankle circumference >35cm
☐	Leg oedema secondary to heart failure		

8 - Colour Codes.		
Red=Chemical prophylasis +/- Mechanical.	Blue=Mechanical Prophylaxis.	Green= No prophylaxis
8.1–Hip surgery (Extended 28 day prophylaxis)	☐ Mechanical ☐ Chemical	
8.2–Elective hip replacement (Extended 28 day prophylaxis, see[1])	☐ Mechanical ☐ Chemical	
8.3–Total knee replacement (Extended 14 day prophylaxis, see[2])	☐ Mechanical ☐ Chemical	
8.4–Lower limb Orthopaedic Surgery (total anaesthesia <60 min)		
a – With VTE risk factors (Extended 1 week prophylaxis)	☐ Mechanical ☐ Chemical	
b – Without VTE risk factors	☐ No specific prophylaxis	
8.5–Lower limb Orthopaedic Surgery (total anaesthesia >60 min) (Extended 1 -2 week prophylaxis)	☐ Mechanical ☐ Chemical	
8.6–Upper limb Orthopaedic Surgery (total anaesthesia <90 min)		
a – With VTE risk factors	☐ Mechanical (2 weeks)	
b – Without VTE risk factors	☐ No specific prophylaxis	
8.7–Upper limb Orthopaedic Surgery (total anaesthesia >90 min)	☐ Mechanical (2 weeks)	
8.8–Below Knee Plaster of Paris		
a – With VTE risk factors	☐ Mechanical ☐ Chemical	
b – Without VTE risk factors	☐ No specific prophylaxis	
8.9–Above Knee Plaster of Paris	☐ Mechanical ☐ Chemical	
8.10–Pelvic or Acetabular Trauma (Extended 3 month prophylaxis)	☐ Mechanical ☐ Chemical	
8.11–Head and neck surgery (Fibula Flaps – No mechanical prophylaxis on operated leg)	☐ Mechanical ☐ Chemical	
8.12–Non-Orthopaedic Surgery (Gastrointestinal / Urological / ENT etc) (Extended prophylaxis for 7 days or until mobility is no longer significantly reduced provided major risk of bleeding is low)	☐ Mechanical ☐ Chemical	
8.13–Vascular	☐ Chemical (1 week)	
8.14–Minor / Day Case	☐ No specific prophylaxis	
9–Timing of Assessment		
☐ On admission	☐ 24hrs post admission	☐ Weekly assessment/Change in condition
10–Information leaflet given to patients/carers on reducing risk of blood clots whilst in hospital? ☐		
11–*Prescribe prophylaxis anticoagulation as per clinical indications above, if no contraindications. If no please choose the reason below:	Yes ○ No ○	
☐ Acute Bleeding	☐ Recent/ acute stroke	☐ INR>2
☐ Low platelets/ HIT	☐ Already taking Warfarin	☐ Heparin sensitivity
☐ Urgent surgical intervention	☐ Patient fully mobile	☐ Already taking DOAC
☐ Already taking Heparin	☐ Other (please document)	
12–Prescribe compression stocking, if no contraindications	Yes ○ No ○	
If no, please document reasons:		
Date of Assessment:	Signed by:	

[1] LMWH 28 days, Apixaban 32-38 days, Rivaroxaban 5 weeks.
[2] LMWH 14 days, Apixaban 10-14 days, Rivaroxaban 2 weeks.

Appendix 3 Mechanical Contra-Indications

The Pennine Acute Hospitals NHS
NHS Trust

Contra-indications to anti embolic stockings / Intermittent pneumatic/foot impulse devices

(Form 1)

Insert patient sticker

Please complete for ALL patients prescribed anti embolic stockings (AES), and/or intermittent pneumatic compression (IPC) devices/foot impulse devices for the contraindications below.
If in doubt, it is essential that they are assessed by the medical team before stockings/intermittent compression/foot impulse devices are given.

Tick **ALL** relevant columns

Patients Condition		***Yes***
Peripheral vascular disease		
Peripheral neuropathy		
Cellulitis (initially patients will be unable to wear stockings until pain and inflammation is resolving.)		
Any local leg conditions with which the stockings would interfere eg dermatitis, gangrene, skin grafts, skin lesions, gout		
Leg oedema secondary to cardiac failure		
Extreme leg deformity		
Gross Leg Oedema		
Leg / foot ulceration		
Known allergies to contents of material		
If patient refuses to wear stockings, this refusal must be documented in notes		
If ankle circumference >35cm (Anti Embolic Stockings contra-indicated)		
If patient on noradrenaline remove stockings		
Suspected or known DVT or PE (IPC contra-indicated)		
Acute Stroke (Use IPC only)		
Patient given stockings/intermittent pneumatic device?	Yes	No

If not given for another reason, please state why:

Signature of Assessor …… Date/Time ……Designation……

Order no WPH539 via supplies

Appendix 4

Pathway for the use of Anti-Embolic Stockings

Insert Patient sticker

Patient Care Plan

Action	Rationale
Pre-Admission	
Patients should be provided with verbal and written information on the risk of blood clots in hospital. Trust leaflet - PI_SU_393	To educate patients regarding venous thromboembolism risks and prevention
On Admission	
A venous thromboembolic risk assessment should be performed on every patient on admission.	To identify patients at risk of venous thrombo-embolic disease in order to ascertain appropriate management.
Following the assessment tool, ascertain whether the patient should wear stockings, and/or intermittent pneumatic devices.	Unless risk is categorised, prevention can be ineffective.
Re-assess the patient at 24 hours then weekly or as condition changes.	Patient risk status may alter during their stay and current method of prevention may be ineffective.
Identify if patient has any contraindications prior to application of stockings. • Peripheral vascular disease • Peripheral neuropathy • Cellulitis • Any local leg conditions with which the stockings would interfere eg dermatitis, gangrene, skin grafts, skin lesions, gout • Leg oedema secondary to cardiac failure • Gross Leg Oedema • Extreme leg deformity • Leg / foot ulceration • Known allergies to contents of stockings • If patient refuses to wear stockings, this refusal must be documented in notes • Ankle circumference >35cm (AES only) • On Noradrenaline • Suspected or known DVT or PE (IPC contra-indicated) • Acute Stroke (Use IPC only) **NB: If any contra-indications in notes, complete and sign (Form 1) and refer to medics**	To reduce the risk of possible hazards associated with inappropriate application of stockings.
Inform the patient of the need to wear anti thrombo-embolic stockings and provide the information leaflet, plus advice re laundering.	Informing the patient, including written information, can improve patient compliance.
Measure the patient carefully in accordance with the manufacturer's instructions.	Optimum therapeutic value is dependent upon well fitted hosiery.

Select the correct size for the patient according to the colour code and size. Document the ankle circumference and stocking size in the stocking pathway.	To identify any changes in size which may need reporting to doctors for further investigation.
Apply stockings, check limb 30 minutes after application for any tissue redness/damage and tissue perfusion.	To identify any tissue ischaemia following application of stockings.
Every Shift	
At regular re-assessments throughout every 24 hour period, the patients legs should be checked to ensure that their hosiery is in place correctly. (ie no wrinkles)	To ensure they are not acting as a tourniquet anywhere as this will increase risk of DVT.
Every Day	
Stockings should be worn 23.5 hours a day. The stockings may remain off for a maximum of thirty minutes in a 24 hour period.	To allow the patient to be washed and check circulation and sensation are adequate and that the skin over pressure points is intact.
Intermittent pneumatic compression devices should be worn for as much time as practical whilst in bed or these can also be used in addition to stockings.	To ensure effective prophylaxis
Legs should be re-measured if there is any sign of oedema or swelling. If an increase in size is noted, this should be documented on Stocking Pathway Plan and hosiery re-prescribed. Please report any increase in size to medical staff.	**An increase in leg diameter of 5cm can double pressure applied by stockings**.
Stockings should be changed every day on patients who are MRSA positive.	**To ensure effective decolonisation.**
Every Three Days	
Clean stockings should be applied every three days or if soiled.	To maintain patient hygiene.
On Discharge	
Patients whose mobility may be restricted or limited after discharge are at risk of DVT for up to 90 days post discharge.	To prevent DVT until patient is fully mobile.
NB: Some patients will require anti-coagulation after discharge. For patients going home on LMWH education on self-administration prior to discharge should be undertaken or a referral made to District Nurse as appropriate	
If patient is unable to apply/remove stockings independently then either refer patient to district nurses or educate family member or carer.	To ensure concordance of stockings.

NB: After three days, stockings should not be thrown away, but should be sent home with patient's relatives and laundered as per manufacturer's instructions.

Appendix 5

Anti-Embolic Stockings Integrated Care Pathway

At Risk	Stockings checked Sign when completed. Date	am	pm	night	Stockings removed for 30 mins daily	Clean stockings every third day	Ankle Size	Stocking Size	Variance / Reason	Action taken and result from action	Signature and Designation
					Yes						
					Yes						
					Yes	Yes					
					Yes						
					Yes						
					Yes	Yes					
					Yes						
					Yes						
					Yes	Yes					
					Yes						
					Yes						
					Yes	Yes					

Patient discharged	Is the patient still at risk of DVT / PE on discharge?	Yes No	…… Signature
If yes:	patient discharged with two pairs of stockings and an information leaflet?	Yes No	…… Designation
	Is patient able to apply and remove stockings independently?	Yes No	…… Date
If no:	Refer to District Nurse or Carer		

Appendix 6

Investigation of Pulmonary Embolism/DVT (Adult)

This rapid review document is to be completed when a patient develops a hospital acquired a Venous Thromboembolism (VTE), Pulmonary Embolism (PE) or Deep Vein Thrombosis (DVT).

Section A will be mostly completed by the VTE Nurse or VTE Lead. Based on the information they have available, you may be asked to provide additional information in section B

A hospital acquired VTE is defined as a VTE occurring either:

[during admission or within 90 days of a previous admission]

1. About the Patient	**Section A**	
Incident Number		
Patients Name		
Hospital Number		
Date of Birth		
Admission Date		
Reason for Admission		
Hospital Site		
Consultant		
Speciality		
Dates of any procedures		
Date of Discharge		
R.I.P Details if applicable	Date:	
	Cause Of Death:	

2. About the VTE				
Reported As:	Pulmonary Embolism		Deep Vein Thrombosis	
Was this VTE	Symptomatic		Asymptomatic	
Date of Diagnosis of VTE			Time	
Type of Imaging				
Location of VTE				
Patient location at diagnosis	During admission		Re-admission	Out-Patient
	Other – specify			

3. Thromboprophylaxis		Outcome
Risk assessment details		
Patient Information Given?		
	Type	Duration
Was patient taking anti-coagulant prior to admission?		
Mechanical		
Chemical		
Treatment at Diagnosis		

4. Brief Chronology of Events: Taken From ALS

5. Summary of Above Information and Further Requirements.

Section B

Initial Clinical Review

6. Please respond to the questions raised in section 5

7. Lessons Learnt		
a.	Are there any lessons learnt from this incident?	Yes or No
If so, please elaborate		

8. As a result of the incident, what is the potential harm to the patient? i.e. treatment, length of stay, complications due to VTE etc.

Completed by: (Name and GMC Number)	
Position:	
Date:	

Once completed at this point return to the governance manager and VTE lead nurse. This will then be reviewed by the Clinical Lead for VTE in the Trust.

VTE lead review

9. In you clinical opinion is this VTE : (mark appropriately)	
	Potentially Avoidable
	Unavoidable
10. What is the clinical rational for this decision?	

Completed by:	
Date:	

Appendix 7

The following will be used in the Initial screening of Hospital Acquired VTE's. If any of the following criteria is identified via the electronic prescribing system the VTE will be considered unavoidable. If the following criteria cannot be identified as being met from the electronic prescribing system and no recognised contra-indication is identified then further information will be requested and the VTE episode managed via the trust incident reporting system under the VTE pathway agreed through the VTE Committee.

1 **Patients Taking An Anti-coagulant prior to admission:**

- If the patient is already taking an anti-coagulant on admission this continues un-interrupted throughout the admission.
- For Warfarin the INR is required to be in therapeutic range unless LMWH is also given alongside OR a contra-indication is identified for each day the anti-coagulant is not given.
- Anti-coagulation continues on discharge or a documented reason is given for not continuing and a plan is made when to re-start the anticoagulant.

PATIENTS NOT TAKING AN ANTI-COAGULANT PRIOR TO ADMISSION WILL NEED TO MEET ONE OF THE FOLLOWING

2 RISK ASSESSMENT INDICATES NO PROPHYLAXIS IS REQUIRED OR ONE OF THE FOLLOWING CRITERIA IS MET

3 Patient Group	**Prophylaxis**	**Extended Prophylaxis**
Medical	Chemical, if contra-indicated then mechanical	No
Critical Care	Chemical, if contra-indicated then AES/IPC	Not Indicated
Pancreatic cancer and chemotherapy with thalidomide, pomalidomide and lenalidomide.	Chemical, if contra-indicated then AES	Duration of chemotherapy treatment
Palliative Care	Chemical, if contra-indicated then Fondaparinux	
End of Life	Not Indicated	
Stroke	IPC (28 days) then Chemical or Chemical only	Not indicated
Varicose Veins with 90 mins plus of surgery	Chemical, if contra-indicated then AES	7 Days Chemical
Endovascular Repair and Open Vascular Surgery	Chemical, if contra-indicated then AES or IPC	7 Days Chemical
Limb Amputation	Chemical, if contra-indicated then IPC on contralateral leg	7 Days Chemical
Abdominal Surgery (Gastro, Gynae, Urology)	Chemical and Mechanical	7 days Chemical for Non Cancer - Abdominal 28 Days Chemical for Cancer Surgery - Abdominal 10 Days Chemical for Gynae
Major Trauma	Chemical and IPC	7 Days Chemical
Oral and maxillofacial surgery	Chemical, if contra-indicated then AES/IPC	7 Days Chemical
ENT surgery	Chemical, if contra-indicated then AES/IPC	7 Days Chemical

Foot and Ankle orthopaedic Surgery over 90 mins and immobilised	Chemical	Until mobile but not beyond 42 days
Upper Limb and over 90 minutes	Chemical	Not Indicated
Hip	LMWH and AES Oral, if contra-indicated then AES	28 – 35 Days Chemical dependent on anti-coagulant
Knee	LMWH and AES Oral, if contra-indicated then IPC	14 Days Chemical
Non Arthroplasty Knee Surgery if over 90 mins	Chemical	14 Days Chemical
Fragility Fractures of the Pelvis, Hip and Proximal Femur	Chemical, if contra-indicated then IPC	Chemical One Month
Lower Limb Immobilisation	Chemical only	Until Mobile but not beyond 42 days
Day Case Surgery over 60 minutes with recognised risk factor	Mechanical Only	

4 Treatment commences at the time of diagnosis for all groups of patients unless a contra-indications is recorded

Appendix 8

STATIONERY

All documentation should be ordered via supplies via fax to 44058 (see order codes below):

- Paper VTE Risk Assessment form - WPH442
- Paper VTE Risk Assessment form for Obstetric - WPH668
- Mechanical Prophylaxis contra-indications - WPH539
- Pathway for the use of anti-embolic stockings - WPH441
- Anti-embolic Stocking Integrated Care Pathway - WPH444
- Reducing the Risk of a blood clot during and after your stay in hospital – PI_SU_393

11. Document Control Information

All sections must be completed by the author prior to submission for approval

Lead Author:	Dr Saravanan. VTE Lead for Bury and Rochdale Care Organisation.		
Lead author contact details:	Contact telephone number and email address 07588 531138 – N.Saravanan@pat.nhs.uk		
Consultation List the persons or groups who have contributed to this policy. (please state which Care Organisation)	**Name of person or group**	**Role / Department / Committee (Care Org)**	**Date**
	Mr T Khan	VTE Lead, North Manchester Care Organisation	02/01/2020
	Dr Yaacoub	VTE Lead, Oldham Care Organisation	January 2020
	Michelle Howard	VTE Nurse	January 2020
	Committee Members representing Bury and Rochdale, North Manchester and Oldham Care Organisations	VTE Committee	23/01/2020
Endorsement List the persons or groups who have seen given their support to this policy. (please state which Care Organisation)	**Name of person or group**	**Role / Department / Committee (Care Org)**	**Date**
	CEC	Oldham Care Organisation	09/01/2020
	CEC	North Manchester Care Organisation	11/12/2019
	CEC	Bury and Rochdale Care Organisation	05/02/2020
	Committee members	VTE Committee	23/01/2020
Keywords / phrases:	Pulmonary Emboli, deep vein thrombosis, thromboprophylaxis, DVT, PE, VTE, AES, HIT, Stockings, Prophylaxis		
Communication plan:	Internal communication Training to FY doctors Link via on-line risk assessment form		
Document review arrangements:	This document will be reviewed by the author, or a nominated person, at least once every three years or earlier should a change in legislation, best practice or other change in circumstance dictate.		

This section will be completed following committee approval

Policy Approval:	Bury and Rochdale CEC	
	Dr Shona McCallum	
	Approval date: 05/02/2020	
	Formal Committee decision (tick)	Chairperson's approval (tick)

12. Equality Impact Assessment (EqIA) screening tool

Legislation requires that our documents consider the potential to affect groups differently, and eliminate or minimise this where possible. This process helps to reduce health inequalities by identifying where steps can be taken to ensure the same access, experience and outcomes are achieved across all groups of people. This may require you to do things differently for some groups to reduce any potential differences.

1a) Have you undertaken any consultation/ involvement with service users, staff or other groups in relation to this document?	**Yes**/No Please state: Circulation to CEC's identified above and VTE committee members
1b) Have any amendments been made as a result?	**Yes**/No • Policy title amendment to confirm policy excludes obstetrics • Section included providing guidance when the electronic prescribing system is unavailable • Include all care organisations when referring to ICT beds • Removal of information regarding cost of managing VTE • Removal appendix listing cohort patients

2) Does this policy have the potential to affect any of the groups below differently or negatively? This may be linked to access, how the process/procedure is experienced, and/or intended outcomes. Prompts for consideration are provided, but are not an exhaustive list.

Protected Group	Yes	No	Unsure	Reasons for decision
Age *(e.g. are specific age groups excluded? Would the same process affect age groups in different ways?)*	x			Policy applicable to 16 years and over only
Sex *(e.g. is gender neutral language used in the way the policy or information leaflet is written?)*		x		
Race *(e.g. any specific needs identified for certain groups such as dress, diet, individual care needs? Are interpretation and translation services required and do staff know how to book these?)*	x			LMWH may not be suited to certain patient groups (section 3 of EIA)
Religion & Belief *(e.g. Jehovah Witness stance on blood transfusions; dietary needs that may conflict with medication offered.)*	x			LMWH may not be suited to certain patient groups.
Sexual orientation *(e.g. is inclusive language used? Are there different access/prevalence rates?)*		x		
Pregnancy & Maternity *(e.g. are procedures suitable for pregnant and/or breastfeeding women?)*	x			Separate policy for Obstetrics
Marital status/civil partnership *(e.g. would there be any difference because the individual is/is not married/in a civil partnership?)*		x		

Gender Reassignment *(e.g. are there particular tests related to gender? Is confidentiality of the patient or staff member maintained?)*		**x**		
Human Rights *(e.g. does it uphold the principles of Fairness, Respect, Equality, Dignity and Autonomy?)*		**x**		
Carers *(e.g. is sufficient notice built in so can take time off work to attend appointment?)*		**x**		
Socio/economic *(e.g. would there be any requirement or expectation that may not be able to be met by those on low or limited income, such as costs incurred?)*		**x**		
Disability *(e.g. are information/questionnaires/consent forms available in different formats upon request? Are waiting areas suitable?) Includes hearing and/or visual impairments, physical disability, neurodevelopmental impairments e.g. autism, mental health conditions, and long term conditions e.g. cancer.*	**x**			There are risks/concerns for some patients

Are there any adjustments that need to be made to ensure that people with disabilities have the same access to and outcomes from the service or employment activities as those without disabilities? *(e.g. allow extra time for appointments, allow advocates to be present in the room, having access to visual aids, removing requirement to wait in unsuitable environments, etc.)*	Yes		

3) Where you have identified that there are potential differences, what steps have you taken to mitigate these?

National guidelines cover only age 16 and above, which is reflected in this policy. The use of the Trust LMWH being porcine derivative is not suited to the Muslim community. Porcine products must only be used in life threatening situations, and then only if non porcine products are not available. This may also impact on vegetarian or vegan groups. A separate policy exists for pregnant patients – Guidelines for thromboprophylaxis in Obstetrics CPWC106

4) Where you have identified adjustments would need to be made for those with disabilities, what action has been taken?

Risks and appropriate adjustments are identified in section 5 of the policy

5) Where the policy, procedure, guidelines, patient information leaflet or project impacts on patients how have you ensured that you have met the Accessible Information Standard – please state below:

Patient leaflets area available and for staff the policy will be available in different formats (such as large print)

……

EDI Team/Champion only*: does the above ensure compliance with Accessible Information Standard*

- Yes

If no what additional mitigation is required:

Will this policy require a full impact assessment? No

(*a full impact assessment will be required if you are unsure of the potential to affect a group differently, or if you believe there is a potential for it to affect a group differently and do not know how to mitigate against this - Please contact the Inclusion and Equality team for advice on* equality@pat.nhs.uk)

Author: Type/sign: Dr Saravanan Date: 13/02/2020

Sign off from Equality Champion: Date: 14/02/2020