Trust Guideline for Adults for Investigation and Management of Venous Thromboembolism (Deep Vein Thrombosis, Pulmonary Embolism and Proximal Superficial Vein Thrombosis)

A Clinical Guideline

For use in:	All clinical areas
By:	Nurses and medical staff
For:	All Patients
Division responsible for document:	Trust wide
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If Yes - does the strategy/policy deviate from the recommendations of NICE? If so why?	Yes, deviants in pathway for investigation of DVT. Assessed in baseline assessment tool of NG158.

This guideline has been approved by the Trust's Clinical Guidelines Assessment Panel as an aid to the diagnosis and management of relevant patients and clinical circumstances. Not every patient or situation fits neatly into a standard guideline scenario and the guideline must be interpreted and applied in practice in the light of prevailing clinical circumstances, the diagnostic and treatment options available and the professional judgement, knowledge and expertise of relevant clinicians. It is advised that the rationale for any departure from relevant guidance should be documented in the patient's case notes.The Trust's guidelines are made publicly available as part of the collective endeavour to continuously improve the quality of healthcare through sharing medical experience and knowledge. The Trust accepts no responsibility for any misunderstanding or misapplication of this document.

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Abbreviations

CTPA	Computed Tomography Pulmonary Angiogram
DD	D dimer
DOAC	Direct oral anticoagulant
DVT	Deep Vein thrombosis
INR	International Normalised Ratio
PE	Pulmonary Embolism
UFH	Unfractionated Heparin
USS	Ultrasound scan
SVT	Superficial Vein Thrombosis
VQ	Pulmonary Ventilation Perfusion scan
VTE	Venous Thromboembolism

Objectives/s

To ensure the safe management of all patients with suspected and confirmed Venothromboembolism (VTE) - Deep Vein thrombosis (DVT), Pulmonary Embolism (PE) and proximal lower limb superficial thrombosis (SVT).

Rationale

VTE is a common medical presentation to both inpatient and outpatient services. This guideline is based on the established guidance as given in the reference section of this guideline.

Broad recommendations

- Patients with suspected VTE (PE or DVT or symptomatic proximal SVT) should be investigated according to the pathways presented in this guideline (pages 4-5).
- Suspected DVT - if a diagnostic scan is indicated and cannot be performed within 4 hours of assessment at NNUH patients should start either therapeutic sc LMWH (LMWH Dosing Advice Sheet), or apixaban (10mg b.d), or rivaroxaban (15mg b.d) or an intravenous infusion of UFH (Unfractionated Heparin Chart) . If there is a contraindication to anticoagulation the reason should be recorded in the patient record and an urgent scan discussed with radiology.
- Suspected PE - As soon as the patient has been assessed as requiring radiological investigation if the scan cannot be done immediately start therapeutic sc LMWH (LMWH Dosing Advice Sheet), or apixaban (10mg b.d.) or rivaroxaban (15mg b.d) or, an intravenous infusion of UFH (Unfractionated Heparin Chart). If there is a contraindication to anticoagulation record the reason in the patient record and discuss urgent scan with radiology. Apixaban or rivaroxban should not be used for patients with haemodynamic instability.
- Patients with DVT or PE confirmed by the results of investigations should start anticoagulation immediately or continue therapeutic anticoagulation , if already started, with one of the following:
    - LMWH and Warfarin (target INR 2.5). LMWH should be stopped once INR >2 for at least 24 hrs.
    - DOAC (Starting a DOAC).
    - LMWH only (e.g. if pregnant).
- Patients with confirmed PE and with haemodynamic compromise should be considered urgently for thrombolytic therapy; see Trust protocol for acute PE in adults. Thrombolysis is not recommended for patients with non-massive PE (i.e.PE without haemodynamic compromise).
- Patients with distal DVT should be treated with therapeutic anticoagulation for at least 6 weeks.

- Patients with proximal DVT (popliteal, femoral or iliac vein) or PE secondary to a transient risk factor should be treated with therapeutic anticoagulation for at least three months.
- Patients with proximal DVT or PE secondary to ongoing risk factors (e.g. pregnancy or leg in plaster) should be treated for at least three months or for the duration of the risk factor, whichever is longer.
- Patients with unprovoked proximal DVT or PE should be treated for at least 3 months and then assessed for risks and benefits of indefinite therapy; see GP advice for managing patients with VTE.
- Patients with unprovoked VTE should not routinely be offered a CT scan to look for underlying malignancy unless there are clinical or laboratory findings to suggest cancer; see GP advice for managing patients with VTE.
- Patients with confirmed SVT within 3 cm of the saphenofemoral junction should be treated with therapeutic anticoagulation for 3 months.
- All patients should be given written information regarding VTE together with a patient held anticoagulant information/dosing record (e.g. the yellow DH booklet or DOAC advice sheet – see click4clots).
- On discharge from the hospital clear arrangements must be made for follow up and monitoring, including transfer of care to primary care.

Patients with cancer

- Patients with venous thromboembolism **and cancer** should receive at least three-six months of LMWH or a DOAC. The choice of LMWH or DOAC is at the discretion of the treating physician, taking into account current evidence for cancer associated thrombosis, tumour site, concurrent cancer treatment and bleeding risk. A clinical decision to treat beyond six months may be made for individual patients depending on the perceived risks and benefits.

NB Patients with VTE found incidentally i.e. unsuspected (e.g. on staging scan) should be treated with therapeutic anticoagulation.

Suspected Deep Vein Thrombosis

Inpatient: Clinical decision rules (e.g. Wells) and D-dimer are unlikely to rule out DVT. Request full leg Doppler ultrasound*

Outpatient: Refer to VTE clinic. Patient investigated as per VTE clinic SOP

Pregnancy:** Guideline for investigation and management of VTE in pregnancy

Results of scan Positive: immediately start or continue therapeutic anticoagulation

Negative: STOP therapeutic anticoagulation

N.B If distal veins not visualised distal DVT has not been excluded and patient should have a repeat scan in one week to look for possible proximal extension

*If scan cannot be done within 4 hours, start an anticoagulant (therapeutic LMWH or apixaban or rivaroxaban) unless contraindicated. If contraindicated record reason in patient record and discuss urgent scan with radiology.

** D-dimer may only be used for patients managed in VTE clinic as per VTE clinic protocol.

Suspected Pulmonary Embolism

Inpatient: Clinical decision rules (e.g. Wells, YEARS) and D-dimer unlikely to rule out PE. Arrange urgent CXR to exclude other causes of symptoms. Request scan for PE*.

Patients presenting to Emergency Department (ED): Follow ED guideline: Emergency department management pathway for pulmonary embolism

All other outpatients: Referred to AMU. Clinical decision rule (e.g. Wells, YEARS) and D-dimer should be used to rule out PE where possible. Arrange urgent CXR to exclude other cause of symptoms. Patients who cannot have PE ruled out using these methods require a scan*.

Pregnancy:** Guideline for investigation and management of VTE in pregnancy

Suspected massive PE: Consider thrombolysis (see Trust protocol for acute PE in adults)

CTPA is the standard investigation for pulmonary embolism, V/Q scan as an alternative should be used if CXR is normal, no history of lung disease (e.g. COPD) and scan is available

Results of scan Positive: immediately start or continue therapeutic anticoagulation

Negative: STOP therapeutic anticoagulation

NB. All patients with a confirmed PE should have a PESI score (or equivalent) documented. This may be used to help guide IP vs OP management and those patients who may require higher level care.

*If scan cannot be done immediately start therapeutic LMWH or apixaban or rivaroxaban unless contraindicated. If contraindicated record reason in patient record and discuss urgent scan with radiology.

** D-dimer may be considered in conjunction with a validated algorithm for pregnancy (e.g. YEARS pregnancy) to avoid imaging.

Investigation and management of Proximal Superficial Vein Thrombosis (SVT)

The terms superficial vein thrombosis and superficial thrombophlebitis are considered the same entity for the purpose of this guideline.

- SVT is predominantly a clinical diagnosis but may be detected on ultrasound
- Patients with SVT are at high risk of concurrent DVT. Patients with SVT will usually need investigation to exclude DVT
- Patients with symptoms of proximal lower limb SVT above the knee should have an USS to determine extent of the SVT and exclude concurrent DVT
- Patients with clinical signs of SVT below knee can have concomitant DVT excluded by D-dimer and Wells score. If DVT not excluded by D-dimer and Wells score, patient will need an ultrasound scan
- Patients with SVT within 3cm of the sapheno-femoral junction should be considered for therapeutic anticoagulation
- For patients with proximal SVT > 3cm from sapheno-femoral junction or extensive below knee SVT (>5cm length) treatment with either prophylactic dose of LMWH or rivaroxaban 10mg daily for 6 weeks is advised
- Patients who are not treated with anticoagulants should be offered NSAIDs (oral or topical) unless contraindicated
- All patients should be advised to seek medical advice if they develop symptoms of VTE after discharge

Investigations for cause of VTE

- Unprovoked VTE can be a presenting feature of malignancy. If clinical history, examination or blood tests indicates a concern further investigation may be required.
- Current guidance is that routine CT scans should not be requested for patients with unprovoked VTE who do not have clinical or laboratory concerns for cancer.

Mechanical interventions

- IVC filters: Only indicated where anticoagulation is contraindicated or PE has occurred on treatment See guideline Vena Cava filter insertion.
- Thrombolysis/mechanical thrombectomy for DVT. Consider referral to vascular surgeons if iliac thrombosis, < 14 days symptoms, life expectancy > 1 year and low bleeding risk.
- Compression stockings for DVT are not routinely recommended. Can be helpful for symptomatic relief but do not impact risk of post thrombotic syndrome.

Thrombophilia Testing

- Testing for heritable thrombophilia is not recommended. Seek advice from haematology if this is being considered for selected cases.
- Testing for anticardiolipin antibodies can be considered in unprovoked VTE if patient has clinical features to suggest the possibility of antiphospholipid syndrome (known SLE/autoimmune disease, livedo reticularis, prolonged

APPT before anticoagulation, recurrent VTE, VTE at unusual sites, arterial thrombosis without risk factors, unexplained thrombocytopenia, unexplained cardiac valve abnormalities, recurrent pregnancy loss/severe pre-eclampsia).

Anticoagulant treatment

- For uncomplicated outpatient treatment of VTE a DOAC is preferred. See Starting a DOAC
- For patients who are extremes of body weight (< 50kg or > 120 kg) see advice in Starting a DOAC
- Warfarin is the recommended treatment for patients with antiphospholipid syndrome
- UFH has complex administration with high risk of error. It should only be used when alternatives are not suitable
- For all patients starting an anticoagulant appropriate anticoagulant counselling should be given. See DOAC counselling checklist
- Heparins are manufactured from animal products and apixaban and rivaroxaban contain lactose from cows milk. For patients in whom these are not acceptable options an alternative parenteral anticoagulant is fondaparinux. Alternative oral anticoagulants are edoxaban, dabigatran or warfarin
- All patients require FBC, renal function LFT and coagulation screen (PT/APTT) prior to starting an anticoagulant
- For patients with significant renal impairment (Cr Cl < 30ml/min) see specific recommendations in LMWH Dosing Advice Sheet and Starting a DOAC regarding contraindications, dose reduction or monitoring.

VTE follow up

All patients discharged following a new VTE diagnosis require follow up in primary care. Selected patients should also be followed up in secondary care. Follow up is required for:

1. Ongoing prescription of anticoagulants.
2. Anticoagulant monitoring (where required).
3. Assessment for underlying cause and modification of thrombotic/bleeding risk factors.
4. Review at 3 months to determine anticoagulation duration.
5. Assessment for post DVT/PE complications and further investigation if needed.

Uncomplicated provoked DVT is suitable for GP follow up only.
Unprovoked DVT should be referred to a haematologist for review at 3 months.
Patients with PE should be referred to a respiratory physician for review at 3 months

Patients with multiple comorbidities who are not able or unlikely to benefit from attending hospital outpatients may be followed up in primary care with advice and guidance from secondary care if needed.

Clinical audit standards

Aspect of care / Service (indicator)	Target % compliance	Exceptions	Instructions or definitions for this indicator
For patients with suspected DVT: Therapeutic anticoagulation started within 4 hours of assessment at NNUH	100%	1. Outpatient with DVT Wells score <3 and DD low 2. Anticoagulation contraindicated 3. USS performed within 4 hours and negative for DVT	
For patients with suspected DVT: if anticoagulation not started within 4 hours of assessment at NNUH reason must be recorded in patient records	100%	None	
For patients with suspected DVT: if USS indicated it should be requested within 12 hours	100%	None	
For patients with suspected DVT if USS indicated it should be performed within 24 hours	100%	None	
For patients with suspected PE: Therapeutic anticoagulation started as soon as clinical assessment completed at NNUH	100%	1. Outpatient with PE Wells score ≤ 4 and DD low 2. Anticoagulation contraindicated 3. If scan performed immediately and shows no evidence of PE	
For patients with suspected PE :If anticoagulation not started as soon as assessment at NNUH indicates that radiological scan is indicated reason must be recorded in patient records	100%	None	
For patients with suspected PE: if radiology investigation indicated this should be requested within 12 hours	100%	None	

Summary of development and consultation process undertaken before registration and dissemination

The guideline was updated by Dr Hamish Lyall on behalf of the Thrombosis and Thromboprophylaxis Committee who approved its content. Suggested amendments were incorporated

Distribution list / dissemination method

Trust intranet.

References / source documents

American College of Chest Physicians Evidence-Based Clinical Practice Guidelines Guyatt GH et al. Executive Summary: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: **CHEST 2012;141 (suppl 2): 7S-47S.**

NICE Guideline NG158 March 2020 Venous thromboembolic diseases: diagnosis, management and thrombophilia testing. https://www.nice.org.uk/guidance/ng158

Thrombosis Canada: clinical guidelines superficial thrombophlebitis/superficial vein thrombosis March 2019 https://thrombosiscanada.ca/clinicalguides/#

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Changes made

Date	Updated version number	Previous version number	Page number / section (updated version)	Details
February 2013	V2	V1	1	Title change to include proximal superficial vein thrombosis
February 2013	V2	V1	2	Use of rivaroxaban included for treatment
February 2013	V2	V1	3	Statement 'to start therapeutic anticoagulation if diagnostic test not performed within 4 hrs added Reference to Haematology treatment algorithm H.MA 192 Trust docs for advice regarding duration added
February 2013	V2	V1	3	Statement 'to start therapeutic anticoagulation if diagnostic test not performed within 4 hrs added Reference to Haematology treatment algorithm H.MA 192 Trust docs for advice regarding duration added
February 2013	V2	V1	5	Flow diagram Results of Wells score changed from 0,1 or 2 to less than 3 US scan changed to full leg US scan Additional words: *N.B If distal veins not visualised distal DVT has not been excluded; patient should have a repeat scan in one week to look for possible proximal extension Instruction to start therapeutic anticoagulation if scan cannot be performed changed from within 6 to 4 hrs
February 2013	V2	V1	6	Scan type – includes V only scan in addition to VQ Instruction to start therapeutic anticoagulation if scan cannot be done immediately unless contraindicated – record reason in patient record
February 2013	V2	V1	7	Section included on SVT
April 2013	V3	V2	8&9	Audit standards added
October 2013	V4	V3	3	"*If there is a contraindication to anticoagulation the reason should be recorded in the patient record and an urgent scan discussed with radiology*" added to 2nd and 3rd bullet points "*start anticoagulation immediately* " added to 4th bullet point

October 2013	V4	V3	5	"*and discuss urgent scan with radiology"* added to instruction if scan cannot be performed within 4 hours and LMWH contraindicated - *immediately* added to instruction if scan positive
October 2013	V4	V3	6	"*and discuss urgent scan with radiology"* added to instruction if scan cannot be performed immediately and LMWH contraindicated- *immediately* added to instruction if scan positive
July 2016	V5	V4	7	SVT management updated
August 2019	V6	V5	All	Apixaban added. SVT advice updated DVT and PE algorithms replaced by text to reflect current practice pathways Links to trust documents for pregnancy, GP VTE advice sheet and DOACs added Grammar/text/formatting changes
September 2020	V7	V6	5-7	Updated to include NICE NG158 recommendations. New sections added for mechanical interventions, thrombophilia, anticoagulation management and VTE follow up. Minor changes to SVT