Worcestershire NHS
Acute Hospitals NHS Trust

Guideline for the Management of Venous Thromboembolism

Including

Management of patients receiving Low molecular weight Heparin

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

1.0 INTRODUCTION

Venous Thrombo Embolism (VTE), manifested as deep vein thrombosis (DVT) and pulmonary embolism (PE), is a major cause of morbidity and mortality. VTE presents with a broad range of clinical signs and symptoms, from asymptomatic calf vein thrombosis to life-threatening, acute, massive PE. Important changes in prevention and treatment of VTE have occurred over the last few years and have been reflected in local, national and international guidelines. This guideline covers the management of adult -patients with venous thromboembolism.

For VTE occurring in pregnancy refer to:
Guidelines for the treatment of venous thromboembolism occurring in pregnancy (2010) WAHT- OBS- 013.
For Thromboprophylaxis and risk assessment refer to:
Thrombo-prophylaxis Guideline (2011) WAHT- HAE- 015.

THIS GUIDELINE IS FOR USE BY THE FOLLOWING STAFF GROUPS:
This guideline is designed for use by clinical and nursing staff managing patients who have symptoms suggesting VTE or diagnosed with VTE.

Education and Training
Education and training for Clinical staff using this guideline is gained during professional education and training, it is the responsibility of all individuals to their maintain professional accountability, ensure they are up-to-date and maintain knowledge and skills in all aspects of thrombosis management

This guideline also covers the use of low molecular weight heparin (LMWH), and it applies to all health professionals who are involved with initiating, prescribing, administering, monitoring and dosing of injectable LMWH anticoagulant therapy

Lead Clinician(s)

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Approved at Clinical Management Committee:	20th February 2013
This guideline should not be used after end of:	20th February 2015

Key amendments to the guideline:

Date	Amendment	By:
10/04/2012	D Dimer result amended according to laboratory changes. Monitoring audit tool amended	Dr Crowther L Hancox
25/08/2012	• Cut off of pre-test score for allowing d-dimer to be used changed from 0 to 1. • For both DVT and PE instructions on how to request a • D-dimer, how to request imaging, roles and responsibilities and ideal timescales is added. • Suggested follow-up investigations for GPs are added.	M Crowther. **Amendments approved by CMC Sept 2012**
18/12/2012	• Suggested rules for rescanning patients with possible DVT changes. • Reminder for those discharging patients on LMWH to provide sharps box • Removed need to monitor platelet count for those on LMWH	M Crowther U Udeshi **Amendments approved by CMC 20th February 2013**

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Guideline for the Management of Venous Thromboembolism

2.0 PURPOSE OF THE GUIDELINE

The purpose of this guideline is to provide good practice guidance for staff managing patients with venous thromboembolism (VTE). This guideline must be used in conjunction with a clinical assessment and other national and local guidelines, policies and procedures.

Priority Aims:

1. Improve accurate diagnosis and prompt treatment of venous thromboembolism (VTE).
2. Prevent progression or recurrence of thromboembolic disease.
3. Reduce the risk of complications from anticoagulation therapy.
4. Improve the safety of using medications by reducing the likelihood of patient harm associated with the use of anticoagulation therapy.

3.0 DETAILS OF GUIDELINE

All patients, admitted to hospital receive a VTE risk assessment to determine their clinical risk of developing a Venous Thrombosis. Nice guidelines (2010) and Department of Health (DOH 2010) provide guidance on assessing risks of VTE and bleeding to reduce the incidence of Hospital acquired Thrombosis.

This Guideline covers patients admitted to the Worcestershire Acute Hospital Trust with diagnosis or symptoms suspecting a VTE. It highlights the safety and the management of anticoagulation therapy and the importance of prompt treatment in patients receiving low LMWH.

3.1 Scope and Target Population:

Adult patients age 18 and over with VTE, excluding those with familial bleeding disorders or pregnancy.

4.0 Clinical features of a DVT

A diagnosis of DVT is usually suspected in patients who complain of a painful swollen limb. However, the clinical picture can vary widely and no clinical feature is sufficiently specific to be diagnostic. Less than a third of patients referred for tests after initial history and clinical examination have a DVT. Clinical diagnosis is notoriously difficult.

4.1 Common Presenting Features:

- Pain or tenderness of the leg
- Swelling of calf or leg
- Pitting oedema
- Palpable venous thrombosis
- Increased temperature in the leg
- Fever
- Discoloration or erythema of the leg
- Venous distension

5.0 Diagnosis of DVT

Patients suspected of having a DVT should have a pretest probability score performed. This consists of scoring points if a clinical feature is present; the score is added at the end:

5.1 Pre-test probability scoring

Clinical feature	Score
Active cancer (treatment ongoing or within previous 6 months or palliative)	1
Paralysis, paresis, or recent plaster immobilisation of the lower extremities	1
Recently bedridden for more than 3 days or major surgery, within 4 weeks	1
Localised tenderness along the distribution of the deep venous sytem	1
Entire leg swollen	1
Calf swelling by more than 3cm when compared with the asymptomatic leg (measured 10cm below tibial tuberosity)	1
Pitting oedema (greater in the symptomatic leg)	1
Collateral superficial veins (non-varicose)	1
Previous documented DVT	1
Alternative diagnosis as likely or greater than that of a DVT	-2

If the score is one or less then a D-dimer should be performed, if this is negative then a DVT can be excluded at this point. If the D-dimer is positive the patient should be referred for imaging.

If the score is two or more the patient should be referred for imaging.

Patients on anticoagulation may have falsely low d-dimers and should not have them performed and progress straight to imaging.

D-dimers are requested through the ICE OrderComms system, they require a single sodium citrate tube and are sent to haematology. The average turnaround time for a d-dimer, from arrival to the lab, is one hour. D-dimer requests require a pretest score written on the form. D-dimers will be reported as positive or negative It is the requester's responsibility to chase the result on the ICE system as the result is not routinely telephoned. The haematology laboratory is CPA accredited and takes part in internal and external quality control therefore all d-dimer results can be assumed to be accurate enough on which to base clinical practice.

5.2 Ultrasound Scan

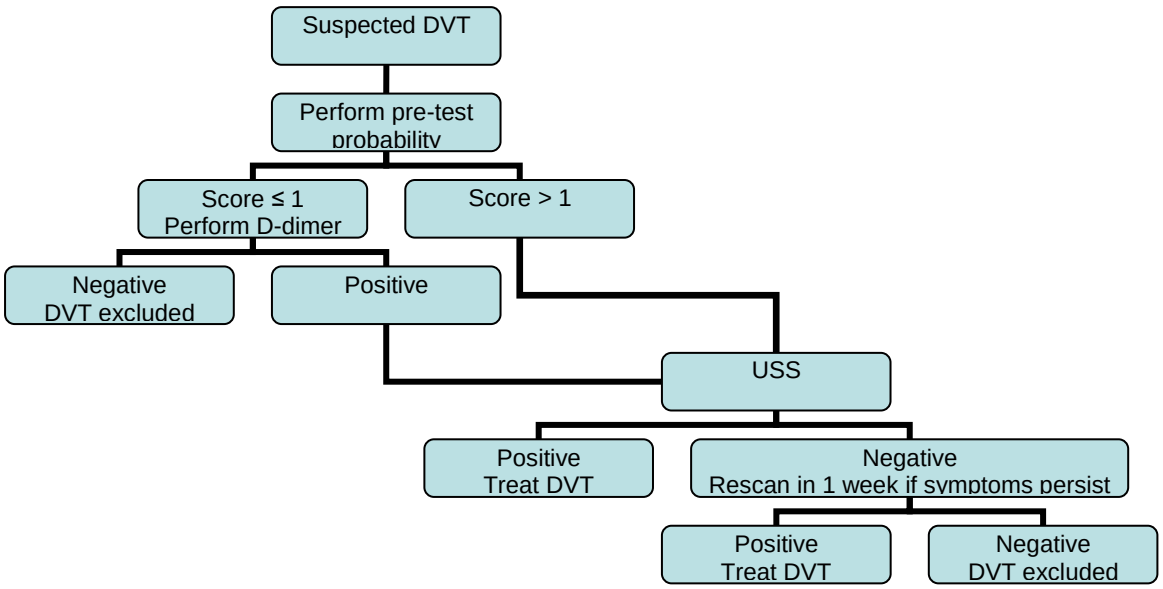
Ultrasound scan (USS) has become the investigation of choice in the diagnosis of DVT. It will detect more than 90% of proximal DVTs (i.e. popliteal vein and above). It is less sensitive for calf vein thrombosis (about only 50% are detected) but pulmonary embolism from this site is rare and unlikely to cause significant haemodynamic disturbance even if it occurs.

Urgent ultrasounds can be requested by discussing the case with the ultrasound radiologist/radiographer and by completing the form on ICE OrderComms. Less urgent scans can be requested on ICE OrderComms. The ultrasound report will appear on the ICE system shortly after the scan has been performed (within 1 hour) or written in the patient notes. It is the requesters role to check for the result, it will not be routinely telephoned. All sonographers/radiologists performing ultrasound scans are appropriately trained.

All patients with suspected DVT's, negative ultrasound scan, no other explanation for their symptoms, should have a clinical review after 1 week. If there is progression of symptoms and continuing clinical concern regarding a DVT, a repeat ultrasound scan can be considered.

Patients with borderline scans or scans which demonstrate clot that cannot be aged should be considered for a venogram.

5.3 DVT Flow Chart



Patients who are to be referred for scanning should start treatment dose LMWH (as long as there is no exclusions) if the scan is likely to be more than four hours distant or there is significant symptoms. The LMWH can be stopped if the scan is negative but if an inpatient they should be assessed for thromboprophylaxis. Patients diagnosed with a DVT who have not already received treatment should receive anticoagulation within 1 hour. The results of all investigations which change management should be documented in the notes.

5.4 Timescales

Patients with a suspected DVT should be initially risk assessed. If a d-dimer is appropriate this should be taken within 1 hour and before any anticoagulation is given. The patient should be informed of the result, and the further plan, within 4 hours of the d-dimer being taken. If the patient requires imaging then they should be informed of the likely time for the scan and whether they require treatment with heparin. The scan should be no more than 72 hours from the time of requesting. The patient should be informed of the result of the scan within 4 hours of the scan. The time of all patient contact events should be recorded in the notes.

These steps should only be performed by a doctor, nurse practioner or nurse from the DVT clinic apart from the d-dimer which can be taken by a trained phlebotomist. The patient should be initially assessed in hospital, the patient should only be sent home if a DVT has been excluded/diagnosed or they are awaiting imaging and has been treated with LMWH. The results of investigations should be given to the patient in hospital in-person by doctor, nurse practioner or nurse from the DVT clinic. The time of all patient contacts should be documented in the patient's notes.

Where the patients care is referred to another department for further investigation/management it is assumed that, on accepting the patient, the department will

continue to follow the appropriate pathway and arrange all further investigations/treatments/referrals.

6.0 Treatment of DVT

Initial treatment of DVT is with LMWH, see below for prescribing guidelines. This is given for a minimum of five days with Warfarin until the INR is >2.0 for 2 days.

The length of anticoagulation is determined by the risk of recurrence and the risk of bleeding, this is individual to the patient but as a guide:

- First unprovoked proximal DVT – 6 months (except antiphospholipid syndrome then lifelong)
- Second unprovoked proximal DVT – lifelong
- Provoked DVT (oestrogen containing pill, hormone replacement, post-surgery or limb immobilisation) – 3 months (or longer if provoking factor still present)
- Intravenous catheter associated – 6 weeks
- Calf DVT – 3 months
- Cancer associated thrombosis – see below

The patient should be fully counselled for the risk of bleeding while on warfarin. They should also be counselled on the signs/symptoms of recurrence to report and what high risk periods to avoid (prolonged immobility without prophylaxis, oestrogen containing medications) and to always inform medical staff of their past medical history if they attend hospital. First degree female relatives of patients with unprovoked DVT should be advised to avoid oestrogen containing medications.

Consideration can be made for treating DVT with the oral anti-Xa agent rivaroxaban full details can be found in the trust guideline on ‘Warfarin and other oral anticoagulants guidelines and procedures’ WAHT-HAE-002.

Thrombolysis should be considered where there is compromise to the viability to the limb or the clot extends into the renal veins causing renal dysfunction.

Inferior vena cava filters should only be considered if there is a contra-indication to anticoagulation e.g. recent haemorrhage or requirement of emergency surgery.

7.0 Pulmonary embolus

A PE is obstruction of the pulmonary artery or one of its branches by an embolus. The embolus usually is a blood clot developing in a deep vein.

For Emergency management of suspected PE see Appendix 1

7.1 Signs & Symptoms

Dyspnoea
Pleuritic chest pain
Substernal chest pain,
Cough,
Haemoptysis,
Syncope,
Tachypnoea (≥20/min),
Tachycardia (>100/min),
Signs of DVT,
Cyanosis,
Pyrexia

8.0 Diagnosis of a PE

All patients with possible PE should have clinical probability assessed and documented. An alternative clinical explanation should always be considered at presentation and sought when PE is excluded. Baseline investigations should include full blood count (FBC), clotting screen, urea & electrolytes (U&E's) liver function tests, glucose, arterial blood gases (ABG), ECG and Chest X-Ray (CXR).

8.1 Clinical scoring system:

Clinical feature	Score
Age >65	1
Previous DVT or PE	3
Unilateral lower limb pain	3
Pain on lower limb deep venous palpation and unilateral oedema	4
Heart rate 75-94	3
Heart rate >95	5
Active malignancy	2
Haemoptysis	2
Surgery or fracture within 1 month	2

If the score is ten or less then a D-dimer should be performed, if this is negative then a PE can be excluded at this point. If the D-dimer is positive the patient should be referred for imaging.

If the score is >10 then the patient should be referred for imaging.

Patients who are to be referred for scanning should start treatment dose LMWH (as long as there is no exclusions).

D-dimers are requested through the ICE OrderComms system, they require a single sodium citrate tube and are sent to haematology. The average turnaround time for a d-dimer, from arrival to the lab, is one hour. D-dimer requests require a pretest score written on the form. D-dimers will be reported as positive or negative It is the requesters responsibility to chase the result on the ICE system as the result is not routinely telephoned. The haematology laboratory is CPA accredited and takes part in internal and external quality control therefore all d-dimer results can be assumed to be accurate enough on which to base clinical practice.

8.2 Investigations

There are several modalities available for diagnosing PE:

- Ventilation/perfusion can be used in patients with a normal chest X-ray and no existing cardiopulmonary disease. If normal a PE can be excluded. Low, intermediate and high probabilities require confirmation with a CTPA.
- CT pulmonary angiogram (CTPA) can be used to diagnose/exclude PE in the majority of cases; the patient must have good renal function due to the use of intravenous contrast.
- Pulmonary angiography is the gold standard but is invasive.
- Echocardiography is useful in diagnosing PE in the emergency situation and it has no side-effects.

CTPAs or V/Q scans can be requested by discussing the case with the duty radiologist and by completing the form on ICE OrderComms. Less urgent scans can be requested on ICE OrderComms. The report will appear on the ICE system shortly after the scan has been performed (within 2 hours) or written in the patient notes, it is the requesters role to check for the result, it will not be routinely telephoned. All radiologists performing the scans are appropriately trained.

The results of any investigations which change management should be documented in the notes. In emergency situations the ICE OrderComms audit trail will determine when the result was viewed, except when the result is given verbally when it should be documented in the notes at the first opportunity.

8.3 Timescales

Patients with a suspected PE should be initially risk assessed. If a d-dimer is appropriate this should be taken within 1 hour and before anticoagulation. The patient should be informed of the result, and the further plan, within 4 hours of the d-dimer being taken. If the patient requires imaging then they should be informed of the likely time for the scan. The scan should be no more than 72 hours from the time of requesting. The patient should be informed of the result of the scan within 4 hours of the scan. The time of all patient contact events should be recorded in the notes.

These steps should only be performed by a doctor or nurse practioner apart from the d-dimer which can be taken by a trained phlebotomist. The patient should be initially assessed in hospital, the patient should only be sent home if a PE has been excluded/diagnosed or they are awaiting imaging and has been treated with LMWH and are felt by an SpR or Consultant to be safe to be managed as an outpatient. The results of investigations should be given to the patient in hospital in-person by doctor or nurse practioner.

Where the patients care is referred to another department for further investigation/management it is assumed that, on accepting the patient, the department will continue to follow the appropriate pathway and arrange all further investigations/treatments/referrals.

9.0 Treatment of PE

Initial treatment of PE is with LMWH, see below for prescribing guidelines. This is given for a minimum of five days with Warfarin until the INR is >2.0 for 2 days.

Treatment of a first episode of PE is usually with six months of anticoagulation, patients with antiphospholipid syndrome and life-threatening PE should be considered for lifelong anticoagulation.

The patient should be fully counselled for the risk of bleeding while on warfarin. They should also be counselled on the signs/symptoms of recurrence to report and what high risk periods to avoid (prolonged immobility without prophylaxis, oestrogen containing medications) and to always inform medical staff of their past medical history if they attend hospital. First degree female relatives of patients with unprovoked PE should be advised to avoid oestrogen containing medications.

9.1 Life-threatening PE

Patients that demonstrate significant hypotension (systolic BP<90mmHg), a history suggestive of symptomatic hypotension e.g. dizziness or syncope or are in a periarrest situation should be considered for thrombolysis. Contra-indications include:

- history of haemorrhagic stroke,
- active intracranial neoplasm,
- recent (<2 months) history of intracranial surgery or trauma and
- active or recent internal bleeding (last six months).

Care should be taken if there is a bleeding diathesis, uncontrolled hypertension, non-haemorrhagic stroke in the last two months, surgery in the previous 10 days or a platelet count <$100x10^9$/L.

Patients who are felt to require thrombolysis but have a contraindication could be considered for catheter or open thrombolectomy.

9.2 Need for hospital admission

A number of studies have confirmed the safety of the management of both DVT and PE in an outpatient setting (Eikelboom J, Baker, R. 2001).

Treatment can be arranged in the community following the DVT Guideline and Patient pathway for the management of patients with DVT in the community (WHAT- HAE-016 2010).

The risks are higher in outpatient management of PE but it is likely that half of patients with PE could be managed without hospitalisation (Wells 1998)

10.0 The Long-Term Complications of VTE

Once VTE develops, the risk of recurrence is high. In addition to the acute risk of PE, a potentially life-threatening event, venous thrombosis also poses risks of intermediate- and long-term complications that include recurrent DVT, post-thrombotic syndrome (possibly leading to venous ulcers), and chronic thromboembolic pulmonary hypertension. The wearing of well fitting compression stockings for two years after a DVT significantly reduces the risk of post-phlebitic syndrome.

Patients with a pulmonary embolism should have an ECG, pulse oximetry and an echocardiogram performed 3 months after to determine if long term complications have developed. This can be arranged by either the GP or the hospital if under follow-up.

11.0 Parenteral anticoagulation

Unfractionated Heparin (UFH) should be considered where massive PE is diagnosed

Otherwise, LMWH should be considered as preferable to UFH, having equal efficacy and safety and being easier to use.

Anticoagulation treatment using a weight banded daily dose of Enoxaparin (Clexane) should commence as soon as the diagnosis is thought likely. Once diagnosis is confirmed treatment should continue with the addition of oral Anticoagulation therapy (usually Warfarin) according to the Worcestershire Oral anticoagulant guideline and BSH (1998) guidelines on Oral anticoagulation

12.0 Oral Anticoagulation

Warfarin is a Vitamin K antagonist, the drug of choice for deep vein thrombosis & Pulmonary Embolism. (British National formulary 2011)

Continuation therapy is usually with an oral anticoagulant, most commonly, Warfarin and is normally started as soon as the diagnosis is made and is given alongside LMWH. Doses are given in accordance with a loading schedule and INR doses as per Trust policy**.**
WARFARIN & OTHER ORAL ANTICOAGULANTS GUIDELINES AND PROCEDURES (2010) WHAT-HAE-002.

For further information and advice regarding Indications for Warfarin, Target INRs and duration of therapy see Trust guideline above.

• Oral anticoagulation should only be commenced once VTE has been reliably confirmed.
• The target INR should be 2.0–3.0; when this is achieved for 2 days or more then heparin can be discontinued.

13.0 Cancer

Venous thrombosis and thromboembolism is a complication for patients with cancer who have a substantial risk of recurrent VTE and bleeding complications. Oral anticoagulant therapy is often problematic in patients with cancer due to drug interactions, malnutrition and vomiting. Liver dysfunction can lead to unstable levels of anticoagulation causing INR's to become erratic. Invasive procedures and thrombocytopenia caused by chemotherapy often require interruption of anticoagulant therapy. Lee, A (2003) demonstrated improved survival in cancer patients given LMWH compared to warfarin. Unlike vitamin K antagonists, low-molecular-weight heparins have predictable pharmacokinetic properties and drug interactions. Cancer patients who have proven VTE should be treated with LMWH for at least six months and until the cancer is in remission, it is possible to reduce the dose to prophylactic levels after six months.

Patients diagnosed with VTE have an increased rate of cancer diagnosis in the year following their DVT. At diagnosis a history and examination should be made looking for cancer. Routine tests should include a full blood count, liver function and bone profile. Smokers should have a CXR performed. Further investigations are only necessary if these initial measures reveal abnormalities.

Guidelines for the Management of patients receiving Low molecular weight Heparin

14.0 Low Molecular Weight Heparin (LMWH)

LMWH produces an immediate anticoagulant effect whereas oral anticoagulants act slowly and their effect builds up over 2-3 days. As a consequence, initially LMWH, followed by oral anticoagulation, is associated with significantly less extension of thrombosis and embolism than in oral anticoagulation therapy alone.

Enoxaparin (Clexane ™) is given on a weight-adjusted basis of 1.5mg/kg body weight, by subcutaneous injection once daily.
Patients are commenced on daily LMWH and continue on daily doses for **at least 5 days, and until the INR reaches 2.0 or above for two consecutive days/tests.**

To ensure consistency of approach within Primary and secondary Health Care the LMWH of choice in Worcestershire for the treatment of DVT & PE is Enoxaparin (Clexane™).

Heparin is the most widely used parenteral anticoagulant. It is available as Unfractionated Heparin (UFH) and Low Molecular Weight Heparins (LMWHs).

Different Heparins are not bioequivalent and should not be interchanged during treatment without the authority of the prescriber (BNF)

Advantages of LMWHs include ease of administration, no need for monitoring in most cases, fewer side effects and possibly improved efficacy. LMWH's are characterized by higher bioavailability and longer half-life, and do not require laboratory monitoring (Hirsh & Levine 1992)
For patients within The Worcestershire Acute Hospital Trust, LMWH is the drug of choice where inpatients are receiving venous thromboembolism prophylaxis or treatment for DVT or PE.
LMWHs are also used in the management of myocardial infarction and unstable angina and in the management of venous thromboembolism in pregnancy.

14.1 Cautions/Contraindications of Heparins

- Active bleeding
- Active peptic ulcer disease
- Known bleeding disorder (e.g. haemophilia)
- Thrombocytopenia (including heparin induced thrombocytopenia)
- Severe renal disease (CKD 4 and 5, eGFR < 30 ml/min), creatinine clearance <30 ml/min or where a patient is suspected to have this degree of renalimpairment.
- Hepatic failure
- Recent cerebral haemorrhage
- Recent eye/neurosurgery
- Uncontrolled severe hypertension
- Acute bacterial endocarditis
- Known allergy to unfractionated or low molecular weight heparin

See latest British National Formulary (BNF)

14.2 Before prescribing LMWH

Weigh patient and document weight on Patient Drug chart, admission sheet and Anticoagulant/Warfarin chart if Warfarin is prescribed.

The patient's weight must be established in kilograms (kg) at the start of therapy and, where applicable, during treatment. The weight must be accurately recorded.

Rapid Response Report (NPSA 2010) recommends action by all Healthcare Sectors and specialities to reduce treatment errors with LMWH. Patients must be accurately weighed and weight recorded in kilograms (Kg) and documented on Patient records. Renal function must be considered to reduce the risk of adverse effects from LMWH's in renal impaired Patients.

Blood tests:

- Full blood count (FBC), INR, Liver function tests (LFTs)
- Renal function, Urea & Electrolytes (U&Es)
- Check for history of bleeding risk, acute peptic symptoms or other contraindications
- Check if patient is on drugs that may prolong bleeding time or affect platelet function (e.g. aspirin, NSAIDs, clopidogrel)

NB Delays in obtaining blood results should not delay initiation of the first dose but every effort must be made to base subsequent dosing on these results

Renal function should also be assessed prior to treatment. The renal function test should not delay the first dose of treatment but every effort should be made to base subsequent dosing on these results. Patients with an e-GFR of <30ml/min/1.73m2 will require dose adjustment. In these patients, seek specialist advice before prescribing LMWH.

15.0 Administering LMWH

All Staff caring for patients and administering LMWH should have the necessary training and competencies to ensure safe practice. Any gaps in competencies must be addressed to their line manager.

All Staff involved in training patients to self administer subcutaneous S/C LMWH anticoagulation injections should have the necessary training/experience and competency to provide the teaching and training to the patient. Ensuring the patient is observed and safe to take on the responsibility.

15.1 The procedure

Inject into the S/C tissue of the anterolateral or posterolateral abdominal girdle, altering from left to right side.

Do not expel the air bubble in the syringe. Vertically introduce the whole length of the needle into the thickness of the skin held between thumb and forefinger

Hold the skin throughout the procedure

Do not rub the injection site

The used needle should be disposed of in a sharps bin. When patients are discharged on LMWH they must be provided with a sharps box,The sharps boxes can be from ward stock and also the manufacturers of enoxaparin – Sanofi will also supply sharps boxes on request. The sharps boxes can then be disposed of through the community pharmacies and if necessary more sharps boxes obtained on prescription from their GP.

16.0 Side effects

Side effects of LMWH include: bleeding, thrombocytopenia (low platelets), osteoporosis, hyperkalaemia, injection site reactions, and allergic reactions
(including urticaria, angiodema and anaphylaxis)

16.1 Monitoring of platelet counts

The risk of antibody-mediated heparin-induced thrombocytopenia also exists with LMWH's. Should thrombocytopenia occur, it usually appears between the 5th and 21st day following the beginning of ENOXAPARIN (Clexane) treatment. Therefore, it is recommended that the platelet counts be measured before the initiation of therapy with ENOXAPARIN (Clexane). No routine measurement of platelet counts are required for patients on LMWH.

16.2 Heparin Induced Thrombocytopenia (HIT)

HIT is an uncommon but potentially life threatening complication; it is less likely to occur with LMWH.
HIT should be considered under the following circumstances:

- Fall in platelet count of 50% or more from baseline, occurring 4-14 days after heparin commenced (N.B. may occur earlier if patients have received heparin within the past 100 days)
- Arterial or Venous Thrombosis occurring while patient on heparin
- Acute Systemic reaction to IV bolus of heparin
- Skin lesions at heparin injection site
- Refer to known patient allergies prior to prescribing

Where the patient has been admitted in the past 100 days to hospital and given heparin they have increased risk of HIT. HIT is rare after 14 days of treatment if suspected, do not give further doses of LMWH until treatment discussed with Haematologist.

16.3 Haemorrhage

As with other anticoagulants, bleeding may occur at any site (see BNF for Adverse Effects). If bleeding occurs, the origin of the haemorrhage should be investigated and appropriate treatment instituted.

17.0 Further investigations to consider

Thrombophylia screen testing: For clotting disorder

18.0 MONITORING TOOL

An audit following the described management will be carried out by the DVT/Anticoagulation Nurse at least annually using the standards within this guideline and the findings reported to the Haematology Directorate which will monitor progress against any action plans.

STANDARDS	%	CLINICAL EXCEPTIONS
All Pts on treatment dose LMWM will have a weight documented	100	None
All suspected DVT diagnoses will follow the algorythm	75	None
All suspected PE diagnoses will follow the algorythm	75	None
All DVT's suitable for anticoagulation will be treated as per the policy	90	None
All PE's suitable for anticoagulation will be managed as per the policy	90	None
All patients are informed of the result of investigations within 2 hours	90	None

The monitoring will be performed by a retrospective review of patient notes. This will determine if the correct pathway is followed. Timing of requests will be found from the notes and the audit trails on WinPath and ICE OrderComms.

19.0 CONTRIBUTION LIST

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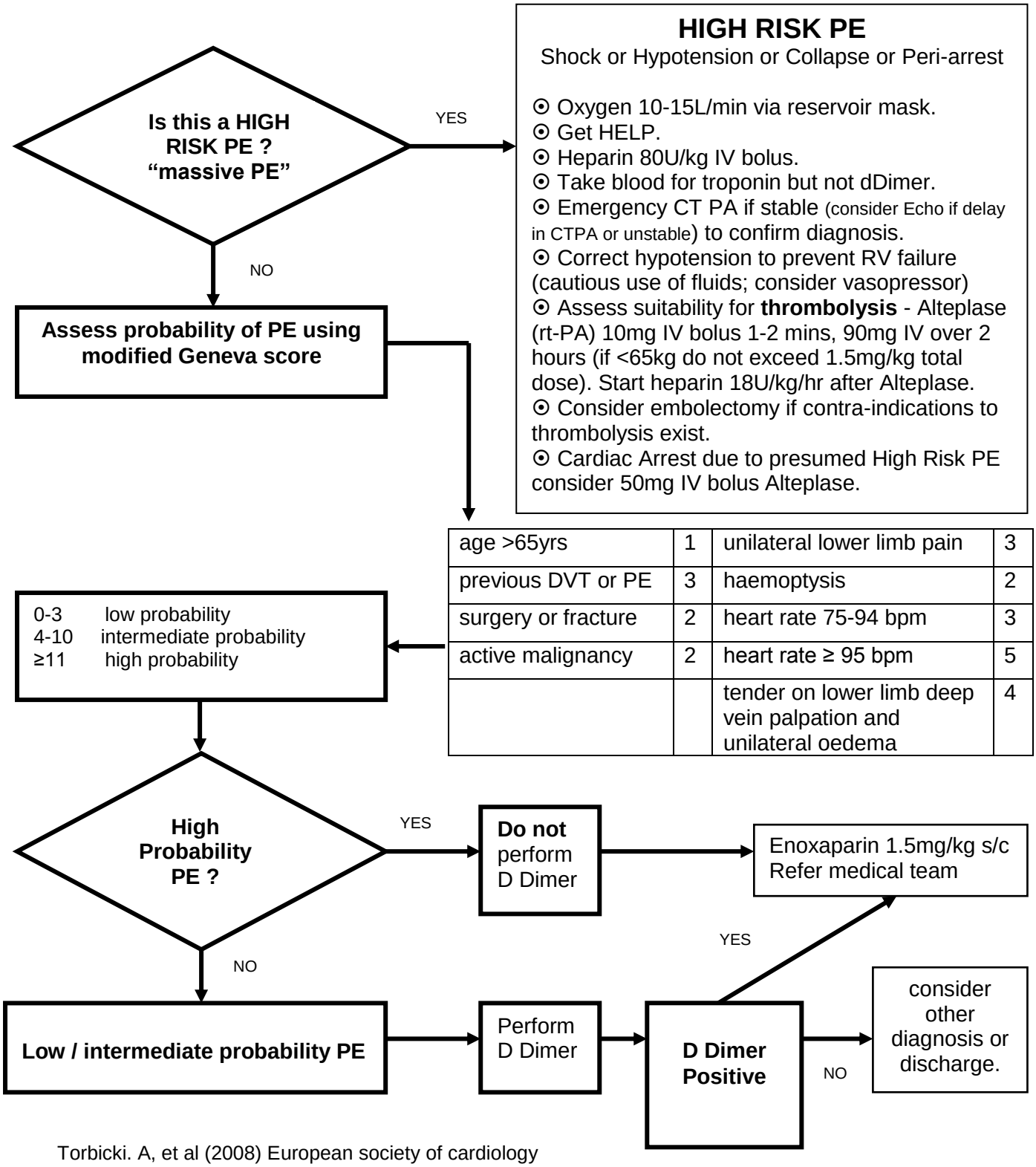
For The Management of Patients with Deep Vein Thrombosis (DVT) In the Community
WHAT-HAE-016

Appendix 1

Emergency Department Management of Suspected Pulmonary Embolus



Torbicki. A, et al (2008) European society of cardiology

Appendix 2

Dosage chart for treatment of DVT, PE or both:

Solution concentration	Patient weight		Syringe	Daily Dose (mg)	Injection volume (ml)
	Kg	Stones/lbs			
100mg/ml solution for injection	40	6/4	60mg/0.6ml (orange)	60	0.60
	45	7/1	80mg/0.8ml (brown)	68	0.70
	50	7/12	80mg/0.8ml (brown)	75	0.75
	55	8/9	100mg/1.0ml (grey)	83	0.85
	60	9/6	100mg/1.0ml (grey)	90	0.90
	65	10/3	100mg/1.0ml (grey)	98	1.0
150mg/ml solution for injection	70	11/0	120mg/0.8ml (mauve)	105	0.70
	75	11/11	120mg/0.8ml (mauve)	113	0.76
	80	12/8	120mg/0.8ml (mauve)	120	0.8
	85	13/5	150mg/1.0ml (dark blue)	128	0.86
	90	14/2	150mg/1.0ml (dark blue)	135	0.90
	95	14/13	150mg/1.0ml (dark blue)	143	0.96
	100	15/10	150mg/1.0ml (dark blue)	150	1.0

The following doses cannot be achieved from a single syringe. Below are suggestions of how to achieve these doses. However, it is up to the treating healthcare professional to decide the best method of achieving the dose:

Patient weight		Daily Dose (mg)	How to administer injection
Kg	Stones/lbs		
105	16/7	158	Administer two 80mg syringes
110	17/4	165	Administer one complete 100mg syringe, and part of one 80mg syringe (injection volume 0.65ml)
115	18/1	173	Administer one complete 100mg syringe, and part of one 80mg syringe (injection volume 0.75ml)
120	18/12	180	Administer one complete 100mg syringe, and one complete 80mg syringe
125	19/9	188	Administer one complete 100mg syringe, and part of another 100mg syringe (injection volume 0.90ml)
130	20/6	195	Administer one complete 100mg syringe, and part of another 100mg

Supporting Document 1 – Checklist for review and approval of key documents

This checklist is designed to be completed whilst a key document is being developed / reviewed.

A completed checklist will need to be returned with the document before it can be published on the intranet.

For documents that are being reviewed and reissued without change, this checklist will still need to be completed, to ensure that the document is in the correct format, has any new documentation included.

1	Type of document	Clinical Guideline
2	Title of document	Guideline for the Management of Venous Thromboembolism
3	Is this a new document?	Yes ☐ No ☒ If no, what is the reference number _WAHT-HAE-019__
4	For existing documents, have you included and completed the key amendments box?	Yes ☒ No ☐
5	Owning department	Haematology
6	Clinical lead/s	Mark Crowther
7	Pharmacist name (required if medication is involved)	
8	Has all mandatory content been included (see relevant document template)	Yes ☒ No ☐
9	If this is a new document have properly completed Equality Impact and Financial Assessments been included?	Yes ☐ No ☐
10	Please describe the consultation that has been carried out for this document	
11	Please state how you want the title of this document to appear on the intranet, for search purposes and which specialty this document relates to.	
Once the document has been developed and is ready for approval, send to the Clinical Governance Department, along with this partially completed checklist, for them to check format, mandatory content etc. Once checked, the document and checklist will be submitted to relevant committee for approval.		

Implementation

Briefly describe the steps that will be taken to ensure that this key document is implemented

Action	Person responsible	Timescale

Plan for dissemination

Disseminated to	Date

1	**Step 1 To be completed by Clinical Governance Department** Is the document in the correct format? Has all mandatory content been included? Date form returned 28/01/2013	Yes ☒ No ☐ Yes ☒ No ☐	
2	Name of the approving body (person or committee/s)	Medicine Safety Committee	Clinical Management Committee
	Step 2 To be completed by Committee Chair/ Accountable Director		
3	Approved by (Name of Chair/ Accountable Director):	Steve Graystone	Penny Venables
4	Approval date	7th February 2013	20th February 2013

Please return an electronic version of the approved document and completed checklist to the Clinical Governance Department, and ensure that a copy of the committee minutes is also provided.

Office use only	Reference Number	Date form received	Date document published	Version No.
	WAHT-HAE-019	04/03/2013	04/03/2013	1.3