

## Trust Policy

### Venous Thromboembolism (VTE) Risk Assessment and Prophylactic Treatment

<b>Author(s)</b>	Dr Allison Tso, Consultant Haematologist
<b>Version</b>	3.1
<b>Version Date</b>	March 2013
<b>Implementation/approval Date</b>	March 2013
<b>Review Date</b>	March 2016
<b>File Reference</b>	109/tw/0/v

### Table of Contents

- 1.0 Introduction
- 2.0 Scope
- 3.0 Roles and Responsibilities
- 4.0 Patient groups excluded from VTE risk assessment
- 5.0 Key priorities for implementation for all patients
- 6.0 Patients having elective surgery (including day surgery)
- 7.0 Patients having emergency surgery / trauma / spinal injury
- 8.0 Patients undergoing orthopaedic surgery
- 9.0 Patients with lower limb plaster casts
- 10.0 Patients having gastrointestinal (including bariatric), gynaecological and urological surgery
- 11.0 Maternity patients
- 12.0 Medical patients
- 13.0 Critical care patients
- 14.0 Patients with a previous history of VTE or thrombophilia or strong family history of VTE +/- thrombophilia
- 15.0 Patient information and planning for discharge
- 16.0 Choice of VTE prophylaxis
- 17.0 Hospital acquired thrombosis
- 18.0 Education and training

- 19.0 Policy / Guideline development
- 20.0 Promotional campaign work
- 21.0 Patient and public information
- 22.0 Review
- 23.0 Monitoring /audit
- 24.0 Reference

Appendix1

Table 1: Risk factors for thrombosis

Table 2: Risk factors for bleeding

Table 3: Maternity patients: If two or more risk factors for thrombosis identified consider offering thromboprophylaxis

Table 4: Maternity patients: If bleeding risk identified from below withhold LMWH

Table 5: Dosage of LMWH in maternity patients

Table 6: Dose of clexane based on patient weight (non surgical non maternity)

Table 7: Dose of clexane (or UFH) in critically ill patients (based on renal function and weight)

Table 8: Contra-indications for anti-embolism stockings

Appendix 2 List of all staff consulted as part of guideline development

Appendix 3 Equalities impact assessment

Appendix 4 Policy submission form

## **1.0 Introduction**

- 1.1 The Department of Health (DoH) has assessed and reported the sizeable problems related to Venous Thromboembolism (VTE) in the NHS in the House of Commons Health Committee Report on the Prevention of Venous Thromboembolism in hospitalised patients (February 2005)<sup>1</sup>, the Government Response to the Health Committee Report (July 2005) and the Report of the Independent Expert Working Group to the CMO and Response of CMO (April 2007)<sup>7</sup>.
- 1.2 VTE causes more deaths than the combined mortality from breast cancer, road traffic accidents, MRSA and AIDS. Without thromboprophylaxis, one in every seven hospitalised patients may develop deep vein thrombosis (DVT) or pulmonary embolism (PE). Approximately ten per cent of hospital deaths are caused by PE<sup>1-6</sup>. A UK survey suggested that 71% of patients assessed to be at medium or high risk of developing deep vein thrombosis did not receive any form of mechanical or pharmacological VTE prophylaxis<sup>2</sup>.
- 1.3 Many of these deaths are preventable through effective VTE prophylaxis<sup>1</sup>. As recommended by the Government's Chief Medical Officer and the Independent Expert Working Group (IWG)<sup>7</sup>, & NICE guidance (CG92)<sup>8</sup>, The Trust has developed and implemented the following in order to demonstrate best practice in the prevention of VTE:
  - 1.3.1 The admitting clinician is responsible for risk assessing the patient on admission, every 24hrs, and whenever clinical condition changes, using the online VTE risk assessment tool available via EPR.
  - 1.3.2 A VTE prevention management programme with a structured and ongoing audit system in order to monitor compliance and effectiveness.
  - 1.3.3 A VTE education and training programme.
  - 1.3.4 Hospital thrombosis committee.
- 1.4 This guideline makes recommendations on assessing and reducing the risk of VTE in patients in hospital, taking into account the potential risks of various options for prophylaxis and patient preferences.
- 1.5 There are separate clinical guidelines for the management of DVTs and PEs (deep vein thrombosis and pulmonary embolisms) obtainable from the intranet.

## **2.0 Scope**

This policy applies to all employees of the Trust in all locations.

## **3.0 Roles and Responsibilities**

- 3.1 The admitting consultant will be responsible to ensure that a) every patient is VTE risk assessed using the on-line risk assessment tool and recorded on EPR, on admission, every 24hrs, and whenever clinical condition changes, b) where appropriate, both pharmacological and mechanical VTE prophylaxes are correctly prescribed.

- 3.2 Consultants /line managers must ensure appropriate VTE training is undertaken by medical and other staff (see section 18.0).
- 3.3 The ward pharmacist will check all interventions are correctly prescribed and administered and remind medical staff to prescribe thromboprophylaxis if not already done so.
- 3.4 All clinicians and the Hospital Thrombosis Committee to apply and maintain high standards of compliance for VTE prophylaxis.
- 3.5 The Hospital Thrombosis Committee will be responsible to ensure that a) correct implementation, regular audit and education is maintained in accordance with DoH recommendations, b) for updating the guidelines and evidence-based electronic programmes in line with changes to NICE and International guidelines.

#### **4.0 Patient groups excluded from VTE risk assessment**

- 4.1 All patients attending medical day unit.
- 4.2 All patients attending endoscopy suite for day case procedures.
- 4.3 All patients attending maternity unit who have an uncomplicated non surgical delivery.
- 4.4 All patients under the age of 18 years
- 4.5 All patients with a history of Heparin Induced Thrombocytopenia / Thrombosis (HITT)

#### **5.0 Key Priorities for Implementation for all patients**

- 5.1 Assess all patients (excluding those identified in 4.0 above) on admission to identify those at increased risk of VTE.
- 5.2 Regard medical patients at increased risk of VTE if they have
  - reduced mobility for 3 or more days
  - expected to have ongoing reduced mobility compared to their normal state
  - one or more of the risk factors shown in [table 1](#).
- 5.3 Regard surgical and trauma patients as being at increased risk if they meet any of the following criteria:
  - surgical procedure with total anaesthetic and surgical time of > 90 minutes
  - surgery time involving pelvis or lower limbs > 60 minutes
  - acute surgical admission with inflammatory intra-abdominal condition
  - expected significant reduction in mobility
  - one or more risk factors shown in [table 1](#)
- 5.4 Assess all patients for risk of bleeding before offering pharmacological thromboprophylaxis. Do not offer pharmacological prophylaxis if patient's bleeding risk out-weighs the risk of thrombosis. Risk factors for bleeding are shown in [table 2](#).
- 5.5 Reassess VTE and bleeding risk every 24 hours after admission, and whenever clinical condition changes to

- ensure appropriate VTE thromboprophylaxis is being used correctly
  - monitor the use of mechanical VTE prophylaxis
  - ensure adverse effects of thromboprophylaxis is identified and appropriately managed.
- 5.6 Do not allow patient to become dehydrated unless clinically indicated.
- 5.7 Encourage all patients to mobilise as soon as possible.
- 5.8 Aspirin or other antiplatelet agents are not adequate prophylaxis for VTE.
- 5.9 Consider temporary inferior vena cava filters for patients who are at very high risk of VTE (i.e. patients with previous VTE event within last 4-6 weeks or active malignancy) if mechanical and pharmacological VTE prophylaxis is contraindicated.
- 5.10 All patients suitable for standard pharmacological thromboprophylaxis should receive low molecular weight heparin according to their weight and renal function. See [table 6](#).
- 5.11 All patients with no contraindications should be fitted with anti-embolism stockings. See contraindications listed in [table 8](#).
- 5.12 Please follow specific regimes stated within this policy for specialist patients groups at high risk below:

Patients having elective surgery (including day surgery)  
 Patients having emergency surgery / trauma / spinal injury  
 Patients undergoing orthopaedic surgery  
 Patient having gastrointestinal (including bariatric), gynaecological and urological surgery  
 Maternity patients  
 Medical patients including stroke and cancer patients  
 Critical care patients  
 Patients with previous history of VTE or Thrombophilia or strong family history of VTE +/- Thrombophilia

## **6.0 Patients having elective surgery (including day surgery)**

- 6.1 Review patient's VTE and bleeding risk and medications at the time when the decision to proceed to surgery is made.
- 6.2 Consider stopping oestrogen-containing oral contraceptive or HRT 4 weeks before surgery.
- 6.3 Assess the risks and benefits of stopping antiplatelet therapy 1 week before surgery (MDT approach recommended i.e. clinician who initiated anti-platelet treatment).
- 6.4 Consider regional anaesthesia in addition to other methods of VTE prophylaxis, as it carries lower risk of VTE compared to general anaesthesia.
- 6.5 If using regional anaesthesia, plan timing of pharmacological prophylaxis to minimise risk of epidural haematoma. If anti-platelet or anticoagulant agents are

being used refer to summary of product characteristics for guidance about safety and timing of these agents in relation to regional anaesthesia.

- 6.6 Do not routinely offer pharmacological or mechanical prophylaxis to patients having surgery with local anaesthesia by local infiltration with no limitation of mobility.
- 6.7 Do not allow patient to become dehydrated unless clinically indicated and encourage all patients to mobilise as soon as possible.
- 6.8 Consider extended thromboprophylaxis for at least 7 days post discharge if mobility not back to normal on discharge.
- 6.9 Advise GP to continue thromboprophylaxis until normal mobility regained.

## **7.0 Patients having emergency surgery / trauma / spinal injury**

- 7.1 Offer mechanical VTE prophylaxis on admission or as soon as clinically possible with either:
  - anti-embolism stockings (thigh or knee length)
  - foot impulse devices
  - intermittent pneumatic compression devices (thigh or knee length)Continue until mobility no longer significantly reduced.
- 7.2 Assess patients' risk of VTE and bleeding. If risk of VTE outweighs risk of bleeding, offer pharmacological thromboprophylaxis with regular reassessments of risks of VTE and bleeding.
- 7.3 Continue pharmacological thromboprophylaxis until mobility no longer significantly reduced.
- 7.4 If the patient is having neurological surgery, or has cranial or spinal injury (acute traumatic or non-traumatic haemorrhage), or spinal vascular malformations (e.g. brain aneurysms) do not offer pharmacological thromboprophylaxis until condition has stabilised or until risk of VTE is greater than the risk of bleeding.
- 7.5 If the risk of major bleeding is low in patients undergoing vascular surgery, offer pharmacological thromboprophylaxis.
- 7.6 Patients with peripheral arterial disease should not be given anti-embolism stockings unless expert opinion states otherwise.

## **8.0 Patients undergoing orthopaedic surgery**

- 8.1 On admission offer mechanical VTE prophylaxis with
  - anti-embolism stockings (thigh or knee length)
  - foot impulse devices
  - intermittent pneumatic compression devices (thigh or knee length)Continue until mobility no longer significantly reduced.
- 8.2 1-12 hours after elective hip or knee replacement surgery, provided there are no contraindications, offer pharmacological VTE prophylaxis. Choose from any of the following:
  - Rivaroxaban (start 6-10 hours after surgery)

- LMWH (or UFH) start 6-12 hours after surgery
  - Dabigatran (start 1-4 hours after surgery)
- 8.2.1 Continue pharmacological VTE thromboprophylaxis for 28-35 days (for elective hip replacement) and for 10-14 days (for elective knee replacement) according to the summary of product characteristics for the individual agent being used.
- 8.3 Patients admitted with hip fracture should be offered mechanical VTE thromboprophylaxis with
- anti-embolism stockings (thigh or knee length)
  - foot impulse devices
  - intermittent pneumatic compression devices (thigh or knee length)
- Continue until mobility no longer significantly reduced.
- 8.3.1 Provided there are no contraindications offer LMWH.
- 8.4 If using LMWH, stop this 12 hours before surgery (6 hours if using UFH, and 24 hours if using Fondaparinux)
- 8.4.1 6-12 hours after surgical closure restart LMWH (or UFH) provided haemostasis is secure. Continue for 28-35 days.
- 8.5 Patients having upper limb surgery do not routinely need VTE prophylaxis unless at admission, assessment of VTE risk is shown to be increased, then consider mechanical +/- pharmacological VTE prophylaxis until patients mobility is no longer significantly reduced.

## **9.0 Patients with lower limb plaster casts**

- 9.1 Assess the risks of VTE and bleeding and if appropriate, offer LMWH (or UFH if renal failure) until lower limb plaster cast removal or normal mobility regained.

## **10.0 Patients having Gastrointestinal (including Bariatric), Gynaecological and Urological surgery**

- 10.1 If VTE risk is increased offer mechanical prophylaxis at admission and continue until mobility no longer significantly reduced.
- 10.2 If risk of major bleeding is low, add LMWH and continue until mobility no longer significantly reduced (generally 5-7 days)
- 10.3 Patients having bariatric surgery who weigh >100kg, should receive pharmacological thromboprophylaxis 12 hourly (see [table 6](#)).
- 10.4 In patients having surgery for major cancer in the abdomen or pelvis continue LMWH once daily for 28 days after surgery.

## **11.0 Maternity patients**

- 11.1 Women who are admitted to obstetric unit and have uncomplicated spontaneous vaginal delivery with a short duration of labour i.e. <12hours do not need VTE risk assessment, they have group exemption.
- 11.2 Women who have prolonged labour lasting >12 hours (+/- instrumental delivery)

- need to have VTE risk assessment performed and prescribed appropriate mechanical thromboprophylaxis with the addition of pharmacological thromboprophylaxis once risk of major bleeding is low.
- 11.3 Any women after delivery who is expected to have reduced mobility relative to normal state for  $\geq 3$  days should be given LMWH for at least 5-7 days or until mobility regained to normal, whichever is the earlier.
  - 11.4 Women with  $\geq 2$  risk factors for thrombosis (see [table 3](#)) should be considered for thromboprophylaxis.
  - 11.5 Withhold LMWH if bleeding risk is identified ([see table 4](#))
  - 11.6 All women who have elective or emergency caesarean section should have VTE risk assessment performed on day of admission and prescribed mechanical and pharmacological thromboprophylaxis if there are no contraindications (i.e. low risk of bleeding). This should be continued for at least 7 days post-natally or until mobility regained to normal whichever is the earlier.
  - 11.7 LMWH should start 6 hours post op (providing haemostasis is secured) and then at 6pm daily thereafter. In addition, appropriate mechanical VTE prophylaxis should be offered at admission.
  - 11.8 Placement or removal of epidural /spinal analgesic catheters should be delayed for 12 hrs after administration of prophylactic dose or 24 hours if treatment dose of Enoxaparin is used. Enoxaparin should not be given sooner than 4 hrs after catheter removal.
  - 11.9 For women who needed antenatal thromboprophylaxis or with known thrombophilia, Enoxaparin should be continued for 6 weeks postpartum.
  - 11.10 For obese patients, use Enoxaparin twice daily for at least 7 days if BMI > 40kg/m<sup>2</sup> irrespective of mode of delivery. Continue prophylaxis until mobility is back to normal.
  - 11.11 Women admitted to hospital during pregnancy or up to 6 weeks post partum who are not planned for caesarean section should be considered for Enoxaparin if  $\geq 1$  risk factor identified from [table 3](#) . Women planned for caesarean section should be offered appropriate mechanical VTE prophylaxis. Enoxaparin should be timed to minimise risk of bleeding.
- 12.0 Medical patients**
- 12.1 Electronic VTE risk assessment of all patients should be undertaken on admission. If risk of VTE outweighs risk of bleeding, prescribe pharmacological thromboprophylaxis providing there is no contraindication. Reassess every 24 hours and whenever clinical condition changes.
  - 12.2 Patients admitted for acute stroke should **not** be offered anti-embolism stockings for VTE prophylaxis. Consideration should be given to foot impulse or intermittent pneumatic compression device until patient can be considered safe to have pharmacological VTE prophylaxis.
  - 12.3 In patients who have had an acute haemorrhagic stroke excluded and whose risk



- of bleeding (haemorrhagic transformation of acute stroke or bleeding into another site) is low consider offering prophylactic dose of LMWH.
- 12.4 Patients presenting with an ischaemic stroke should be discussed with the Stroke Physicians regarding suitability of pharmacological thromboprophylaxis.
  - 12.5 Patients with cancer who are receiving oncological treatment and are ambulant should not be routinely offered thromboprophylaxis unless other risk factors of thrombosis are identified.
  - 12.6 Patients with cancer who are not on oncological treatment and are not ambulant, who have increased VTE risk should be considered for pharmacological thromboprophylaxis providing there is no contra-indication with assessment every 24 hours and whenever clinical condition changes.
  - 12.7 Patients who are receiving palliative care in terminal stages or end-of life care pathway should not routinely be offered mechanical or pharmacological thromboprophylaxis. Patients who have potentially reversible acute pathology should be considered for thromboprophylaxis providing this would not impair quality of life.
  - 12.8 Patients with central venous catheters who are not ambulant should be considered for pharmacological thromboprophylaxis.
- 13.0 Critical Care patients**
- 13.1 Assessment of risks of VTE and bleeding should be undertaken on admission to Critical Care Unit. Offer VTE prophylaxis according to reason for admission, body weight and renal function ([table 7](#)). Take into account planned interventions and other therapies that might increase risk of complications.
  - 13.2 Reassess risks of VTE and bleeding and review decisions about VTE prophylaxis daily (more frequently if clinical condition is changing rapidly)
  - 13.3 Take into account views of the multidisciplinary team, patients, family/carers.
- 14.0 Patients with a previous history of VTE or Thrombophilia or strong family history of VTE +/- Thrombophilia**
- 14.1 VTE risk in such patients is high. Check that bleeding risk is not greater than thrombosis risk.
  - 14.2 Prescribe mechanical and pharmacological thromboprophylaxis on admission if bleeding risk not identified or lower than thrombotic risk. If risk status unclear contact Haematologist for advice.
- 15.0 Patient Information and planning for discharge**
- 15.1 Before starting VTE prophylaxis, offer patients and / or their families or carers verbal and written information on:
    - the risks and possible consequences of VTE
    - the importance of VTE prophylaxis and its possible side effects
    - the correct use of VTE prophylaxis (e.g. anti-embolism stockings, foot impulse or intermittent pneumatic compression devices)

- how to reduce risk of VTE i.e. keeping well hydrated, mobile etc
- 15.2 As part of discharge planning, offer patients / families / carers verbal and written information on:
- the signs and symptoms of deep vein thrombosis and pulmonary embolism
  - the correct and recommended duration of use of VTE prophylaxis at home (if discharged with prophylaxis)
  - the importance of using VTE prophylaxis correctly and continuing treatment for the recommended duration
  - the signs and symptoms of adverse events related to VTE prophylaxis.
  - a named person to contact (i.e. GP or team responsible for initiating thromboprophylaxis) if they have any problems using the prophylaxis.
  - The importance of seeking medical help if they develop any signs and symptoms of pulmonary embolism or deep vein thrombosis or other adverse event.

## **16.0 Choice of VTE prophylaxis**

- 16.1 Base the choice of mechanical VTE prophylaxis on clinical condition, surgical procedure and patient preference. Choose any of the following;
- anti-embolism stockings (thigh/knee length) see [table 8](#) for contraindications
  - foot impulse devices
  - intermittent pneumatic compression devices (thigh or knee length)
- 16.2 Base the choice of pharmacological VTE prophylaxis dependant on clinical condition:
- enoxaparin 40mg sc od (for pregnant/overweight patients, see [table 5](#) and [table 6](#))
  - enoxaparin 20mg sc od if weight < 50kg or eGFR/CrCL 15-30ml/min
  - unfractionated heparin sc 5000 units every 12 hours (if eGFR/CrCL <15ml/min or high risk of bleeding as effects can be easily reversed by stopping heparin or giving Protamine Sulphate (see [table 7](#)))
- 16.3 Do not offer additional pharmacological or mechanical VTE prophylaxis to patients who are taking vitamin K antagonists (e.g. Warfarin) who are within their therapeutic range, or are having full anticoagulant therapy (i.e. LMWH / UFH / Fondaparinux) providing this anticoagulant therapy is continued.

## **17.0 Hospital Acquired Thrombosis**

- 17.1 There is a Trust Surveillance and Incident Reporting of Hospital Acquired Thrombosis (HAT) as a Serious Untoward Incidents. This will trigger a thorough investigation and will be used as performance indicator.
- 17.2 All Serious Incidents and Serious Untoward Incidents are reported to the Patient Safety Committee and ICC.
- 17.3 All HATs are picked up by the tracking of all positive cases of DVTs and PEs identified through radiological imaging, by the warfarin anticoagulation clinics and through incident reporting, and discussed in the Hospital Thrombosis Committee.

## **18.0 Education and Training**

- 18.1 Training will be delivered in line with the Trust Training Needs Analysis. e-VTE is an e-learning resource for Venous Thromboembolism developed for Healthcare individuals. It is mandatory that all FY1 and FY2 doctors joining the Trust complete the e-VTE training through the website <http://e-lfh.org.uk/projects/vte/launch/>. The certificate of completion must be submitted to the Medical Education Department at the end of the induction week.
- 18.2 Line managers and consultants are responsible for following up attendance/non attendance of VTE risk assessment training. Attendance compliance is monitored by the Training Committee, Postgraduate Education department, Hospital Thrombosis Committee and reported to the Trust board.
- 18.3 In addition, there are regularly held lectures on VTE and anticoagulation for junior doctors as part of their postgraduate education programme.

## **19.0 Policy/Guideline Development**

- 19.1 The VTE policy will undergo regular review as new guidelines or evidence become available or, alternatively as a matter of Trust policy, every 3 years.

## **20.0 Promotional Campaign Work**

- 20.1 The Hospital Thrombosis Committee will aim to raise the awareness of staff across the Trust on VTE Risk Assessment and correct prescription of thromboprophylaxis by:
- VTE awareness days, posters and presentations to staff
  - Dissemination of information through Trust intranet and email
  - Articles in the staff magazine (Homerton Life)
  - Continuous updating and feedback of cases of Hospital Acquired Thrombosis

## **21.0 Patient and Public Information**

- 21.1 The Thrombosis Committee will provide the public and service users information leaflets on VTE prevention via the Patient Experience Group and various presentations at members meetings. The Trust website contains information on management of VTE and a link to the website for the Trust's surveillance figures.

## **22.0 Review**

- 22.1 This Policy should be kept under review in the light of changing circumstances and requirements and reviewed routinely every three years.

## **23.0 Monitoring/Audit**

- 23.1 The processes for monitoring compliance with this procedure are outlined below:

<b>Measurable Policy Objective</b>	<b>Monitoring/Audit</b>	<b>Frequency of monitoring</b>	<b>Responsibility for performing the monitoring</b>	<b>Monitoring reported to which groups/committees, inc responsibility for reviewing action plans</b>

Greater than 90% of patients risk assessed for VTE using national tool	Monitoring through EPR	Monthly	Deputy Operations Manager	Thrombosis Committee
The process for VTE prophylaxis is followed (including appropriate prescription and administration)	Incidents and near misses involving VTE  Spot audits (including ACU and other specialist areas e.g. orthopaedics, maternity...)	Ad hoc  3 times a year	Incident Reporting Group  Hospital thrombosis committee and clinical teams	Patient Safety Committee  Hospital Thrombosis Committee
Mandatory VTE training for all new FY1 and FY2 doctors	100% compliance (supported by certificate of completion)	Twice a year (FY rotations)	Training committee, postgraduate education	Hospital Thrombosis committee
Hospital acquired thrombosis (HAT)	Investigation of all HAT cases	Ad hoc	Incident Reporting Group	Hospital Thrombosis committee  Patient Safety Committee

## 24.0 References

1. House of Commons Health Committee. In: The prevention of venous thromboembolism in hospitalised patients, HC 99, The Stationary Office Limited, London, England. 2005
2. National Statistics. Health Statistics Quarterly, spring 2005, 24 February 2005.
3. Cancer Research UK Mortality Cancer Stats 2004. Breast Cancer Factsheet – February 2004 [www.cancerresearchuk.org]
4. Department of Transport, National Statistics, road casualties Great Britain, 24 June 2004 [www.dft.gov.uk]
5. Health Protection Agency. AIDS/HIV Quarterly Surveillance Tables. No 65: 04/04, January 2005.
6. Samama MM et al N Eng J Med 1999;341:793-800.
7. Department of Health, Chief Medical Officer. Report of the expert working group on the prevention of venous thromboembolism in hospitalised patients, London, April 2007.
8. NICE clinical guideline 92. Venous thromboembolism: reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in inpatients undergoing surgery. Jan 2010, www.nice.org.uk/CG92.

9. A Howard. The Prevention of Post-Operative Deep Vein Thrombosis. MD Thesis, University of London, 2006.
10. A Howard, D Zaccagnini, A Williams, M Ellis, AH Davies, RM Greenhalgh. Randomised Clinical Trial of Low Molecular Weight Heparin with Thigh-length and Knee-length Antiembolism Stockings for Patients Undergoing Surgery. *BJS* 2004;91:842-7.
11. Nicolaides AN. In: Breddin HK, Fareed S, Goldhaber S, Haas S, Hull R, Kalodiki E, Myers K, Samara M, Sasahara A, editors. Prevention of venous thromboembolism. International Consensus Statement, Guidelines compiled in accordance with the scientific evidence. Med-Orion Publ Comp, London. Edition 2002.
12. Department of Health. Risk Assessment for Venous Thromboembolism (VTE). London March 2010  
[http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/@ps/documents/digitalasset/dh\\_113355.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/digitalasset/dh_113355.pdf)
13. Department of Health. VTE prevention programme. A patient Safety Priority. King's Thrombosis Centre. Edited Dr R Arya. June 2009  
[http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/documents/digitalasset/dh\\_101397.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_101397.pdf)
14. Department of Health, Chief Medical Officer. New drive to save lives from venous thromboembolism in hospitalised patients, London, June 2009.  
[http://www.dh.gov.uk/en/News/Recentstories/DH\\_101516](http://www.dh.gov.uk/en/News/Recentstories/DH_101516)

## Appendix 1 Tables

**Table 1: Risk factors for thrombosis**

Patient Related	Admission Related
Active Cancer or Cancer Treatment	Significantly reduced mobility for $\geq 3$ days
Age > 60	Hip or Knee replacement
Dehydration	Hip Fracture
Known Thrombophilia	Total anaesthetic + surgical time >90 minute
Obesity (BMI > 30)	Critical care admission
$\geq 1$ significant medical co-morbidities Heart disease; metabolic, endocrine or respiratory disorders, acute infectious diseases, inflammatory conditions (including acute admission with IBD), lower limb paralysis (excluding acute stroke)	Surgery involving pelvis or lower limb with total anaesthetic + surgical time > 60 minutes
Personal history or 1 <sup>st</sup> degree relative with history of VTE	Acute surgical admission with inflammatory or intra-abdominal condition
On hormone replacement therapy	Surgery with significant reduction in mobility
On oestrogen-containing contraceptive therapy	Plaster cast immobilisation of lower limb
Varicose vein with phlebitis	
Pregnancy of < 6 weeks post partum	

**Table 2: Risk factors for bleeding**

Patient Related	Admission Related
Active bleeding	Neurosurgery, spinal surgery or eye surgery
Acquired bleeding disorder (ie acute liver failure)	Other procedure with high bleeding risk
Concurrent use of anticoagulant (ie warfarin with INR >2)	Lumbar puncture / Epidural / Spinal anaesthesia expected within the next 12 hours
Untreated inherited bleeding disorder (i.e. Haemophilia, von Willebrand's Disease)	Lumbar puncture / Epidural / Spinal anaesthesia within the previous 4 hours
Thrombocytopenia (platelets $<75 \times 10^9 /L$ )	
Acute stroke	
Uncontrolled hypertension $\geq 230/120$ mmHg	

**Table 3: Maternity patients: If two or more risk factors for thrombosis identified consider offering thromboprophylaxis**

Patient Related	Admission Related
Age > 35 years	Current infection
Para 3 or more	Immobility prior to surgery
Obesity BMI > 30 at booking	Pre-eclampsia
Known Thrombophilia	Prolonged labour > 24hours
Smoker	PPH > 1 litre of blood transfusion
Significant medical co-morbidity (cardiovascular, metabolic, endocrine, respiratory, acute infectious disease, sickle cell disease, cancer, dehydration, varicose veins with phlebitis, inflammatory conditions)	Any surgical procedure in Puerperium
Personal history or 1 <sup>st</sup> degree relative with history of VTE	Prolonged bed rest, immobility e.g. symphysis pubis dysfunction
Multiple pregnancy or Assisted Reproduction Treatment	Hyperemesis, dehydration, ovarian hyperstimulation, sickle cell crisis
Long haul travel within 2 weeks	Critical care admission

**Table 4: Maternity patients: If bleeding risk identified from below withhold LMWH**

Patient Related	Admission Related
Uncontrolled blood pressure (200/110)	Active bleeding (APH, Bleeding Placenta Praevia, Abruption)
Acute fatty liver / HELLP with low platelets	Active Labour / Early labour
Thrombocytopenia ( platelets < 75)	Induction of labour
Inherited bleeding disorders ( e.g. Von Willebrand Disease)	Epidural / Spinal Analgesia expected within the next 12 hours or within the previous 4 hours of Epidural or Spinal procedure

**Table 5: Dosage of LMWH in Maternity patients**

Up to 100 Kg	40mg once daily Enoxaparin
100- 150 Kg	40mg twice daily Enoxaparin
Over 150 Kg	60mg twice daily Enoxaparin

**Table 6: Dose of clexane based on patient weight (non maternity)**

<50kg	20mg Enoxaparin sc once daily
Up to 100kg	40mg Enoxaparin sc once daily
100kg -150kg	40mg Enoxaparin sc 12 hourly
>150kg	60mg Enoxaparin sc 12 hourly

**Table 7: Dose of Enoxaparin (clexane) (or UFH) in critically ill patients (based on renal function and weight)**

Weight	<50kg	50-100kg	100-150kg	>150kg
eGFR<15 mls/min	UFH 5000 units BD SC	UFH 5000 units BD SC	UFH 7500-10000 units BD SC	UFH 10000 units BD SC
eGFR 15-30 mls/min	Clexane 20mg OD SC	Clexane 20mg OD SC	Clexane 20mg BD SC	Clexane 30mg BD SC
eGFR >30 mls/min	Clexane 20mg OD SC	Clexane 40mg OD SC	Clexane 40mg BD SC	Clexane 60mg BD SC

**Table 8: Contra-indications for Anti-Embolism Stockings**

1. Peripheral vascular disease
2. Peripheral arterial bypass graft
3. Leg ulcers
4. Dermatitis
5. Broken , fragile or blistered skin
6. Gangrene
7. Recent skin graft
8. Peripheral neuropathy / Sensory impairment
9. Lower limb deformity
10. Unusual leg size or shape / leg oedema
11. Cardiac failure
12. Stroke patients
13. Known allergy to stockings

## **Appendix 2 List of all staff consulted as part of guideline development**

### **Initial consultation**

Dr John Coakley (Medical Director)  
 Dr Roger Amos (Consultant Haematologist)  
 Hospital Thrombosis Committee

### **Final consultation**

All Trust consultants  
 Clinical Audit & Effectiveness Lead Trust  
 Clinical Audit & Effectiveness Leads of Division A, Division B, Division C  
 Clinical Directors of Division A, Division B, Division C  
 Chief Executive, Chair of Clinical Board  
 All Executive Directors  
 General Managers of Division A, Division B, Division C



### Appendix 3 Equalities Impact Assessment

This checklist should be completed for all new Corporate Policies and procedures to understand their potential impact on equalities and assure equality in service delivery and employment.

<b>Policy/Service Name:</b>	<b>Venous thromboembolism risk assessment and prophylactic treatment</b>
<b>Author:</b>	<b>Dr Allison Tso</b>
<b>Role:</b>	<b>Consult Haematologist</b>
<b>Directorate:</b>	<b>IMRS</b>
<b>Date</b>	<b>March 2013</b>

<b>Equalities Impact Assessment Question</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>
1. How does the attached policy/service fit into the trusts overall aims?			Compliance with health and social care act 2009
2. How will the policy/service be implemented?			Systems already in place as any changes have already been implemented
3. What outcomes are intended by implementing the policy/delivering the service?			Compliance with health and social care act 2009
4. How will the above outcomes be measured?			Compliance with health and social care act 2009
5. Who are they key stakeholders in respect of this policy/service and how have they been involved?			Infection control committee given opportunity to comment
6. Does this policy/service impact on other policies or services and is that impact understood?		No	
7. Does this policy/service impact on other agencies and is that impact understood?		No	
8. Is there any data on the policy or service that will help inform the EqIA?		No	

9. Are there are information gaps, and how will they be addressed/what additional information is required?		No	
10. Does the policy or service development have an adverse impact on any particular group?		No	
11. Could the way the policy is carried out have an adverse impact on equality of opportunity or good relations between different groups?		No	
12. Where an adverse impact has been identified can changes be made to minimise it?		N/A	
13. Is the policy directly or indirectly discriminatory, and can the latter be justified?		No	
14. Is the policy intended to increase equality of opportunity by permitting Positive Action or Reasonable Adjustment? If so is this lawful?		N/A	

### **EQUALITIES IMPACT ASSESSMENT FOR POLICIES AND PROCEDURES**

2. If any of the questions are answered 'yes', then the proposed policy is likely to be relevant to the Trust's responsibilities under the equalities duties. Please provide the ratifying committee with information on why 'yes' answers were given and whether or not this is justifiable for clinical reasons. The author should consult with the Director of HR & Environment to develop a more detailed assessment of the Policy's impact and, where appropriate, design monitoring and reporting systems if there is any uncertainty.
  
3. A copy of the completed form should be submitted to the ratifying committee when submitting the document for ratification. The Committee will inform you if they perceive the Impact to be sufficient that a more detailed assessment is required. In this instance, the result of this impact assessment and any further work should be summarised in the body of the Policy and support will be given to ensure that the policy promotes equality.

## Appendix 4 Policy Submission Form

To be completed and attached to any policy or procedure submitted to the Trust Policy Group

<b>1</b>	<b>Details of policy</b>	
1.1	Title of Policy:	VTE Risk Assessment and Prophylactic Treatment
1.2	Lead Executive Director	Dr John Coakley, Medical Director
1.3	Author/Title	Dr Allison Tso, Consultant Haematologist
1.4	Lead Sub Committee	Hospital Thrombosis Committee
1.5	Reason for Policy	Compliance with Health and Social Care Act 2009
1.6	Who does policy affect?	All Trust staff
1.7	Are national guidelines/codes of practice incorporated?	Yes
1.8	Has an Equality Impact Assessment been carried out?	Yes
<b>2</b>	<b>Information Collation</b>	
2.1	Where was Policy information obtained from?	Health and Social care act 2009
<b>3</b>	<b>Policy Management</b>	
3.1	Is there a requirement for a new or revised management structure if the policy is implemented?	No
3.2	If YES attach a copy to this form	N/A
3.3	If NO explain why	Systems already in place
<b>4</b>	<b>Consultation Process</b>	
4.1	Was there internal/external consultation?	
4.2	List groups/Persons involved	See Appendix 1
4.3	Have internal/external comments been duly considered?	Yes
4.4	Date approved by relevant Sub-committee	

4.5	Signature of Sub committee chair	
<b>5</b>	<b>Implementation</b>	
5.1	How and to whom will the policy be distributed?	To all trust staff through the Trust Intranet and mandatory training
5.2	If there are implementation requirements such as training please detail?	No
5.3	What is the cost of implementation and how will this be funded?	N/A
<b>6</b>	<b>Monitoring</b>	
6.1	List the key performance indicators e.g. core standards	See document
6.2	How will this be monitored and/or audited?	See document
6.3	Frequency of monitoring/audit	See document

**Date policy approved by Trust Policy Group:**

..... 18/3/2013 .....

**Signature of Trust Board Group chair:**

.....  .....