Mid Essex Hospital Services NHS
NHS Trust

VENOUSTHROMBOEMBOLISM (VTE) RISK ASSESSMENT AND THROMBOPROPHYLAXIS IN MATERNITY	CLINICAL GUIDELINES Register No: 08014 Status: Public

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3.0	Sajida Ajjawi	March 2008
3.1	Equality and diversity; audit and monitoring update; Update to points 6.0, 5.4	December 2010

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1.0 Purpose of Guideline

1.1 This guideline is designed to help maternity staff to identify, counsel and put the women who need antenatal and postpartum thromboprophylaxis on the correct pathway of care. (Refer to the guideline entitled 'Management during labour, delivery including caesarean section'; register number 08033 and 'Management of VTE during antenatal and postnatal period; register number 12007)

2.0 Equality and Diversity

2.1 The Trust is committed to the provision of a service that is fair, accessible and meets the needs of all individuals.

3.0 Background

3.1 A significant fall in maternal death due to VTE is following publication of RCOG guideline 'thromboprophylaxis' in 2004. It is likely that the fall in deaths is the result of better recognition of at-risk women and widespread thromboprophylaxis.

3.2 The overall incidence of VTE in pregnancy and the puerperium was 1–2/ 1000. The case fatality rate of pulmonary embolism was 3.5%. According to the UK Obstetric Surveillance System cohort, 70 % (no 143) of fatal and nonfatal antenatal pulmonary embolisms also had identifiable risk factors.

3.3 Many antenatal VTE events occur in the first trimester and therefore, if a decision is made to initiate antenatal thromboprophylaxis, this should begin as early in pregnancy as practical.

3.4 The postpartum period is the highest risk period for VTE, and five times higher in postpartum compared with pregnancy.

3.5 The Trust wide audit of VTE prophylaxis is mandatory. This is part of Commissioning for Quality and Innovation (CQUIN) target contract 2010; which states that 90% of patients admitted have to be risk assessed on admission and within 24 hours and of patients assessed as being high risk, 100% have to receive appropriate thromboprophylaxis.

4.0 Recommendations

4.1 All women should undergo a documented assessment of risk factors for VTE in early pregnancy or before pregnancy. All pregnant women should have a documented VTE risk assessment at the booking appointment whilst the comprehensive history is being taken.through a comprehensive clinical assessment. (Refer to Appendix F)

4.2 Repeat VTE risk assessment if a patient is **admitted to the hospital** for any reason or develops other inter-current problems during pregnancy and postpartum period.

4.3 All women require VTE risk assessment **following delivery** and before discharge; and arrangements made for subcutaneous low molecular weight heparin (LMWH) prescription and administration (usually by the woman herself) in the community where necessary.

4.4 Midwives and doctors should be alert to changes in the woman's situation and that her risk status may change several times during the course of the pregnancy and the postnatal period.

4.5 Body mass index must be calculated at booking visit and documented in the Antenatal Care Record. As obesity remains the most important risk factor for VTE. The revised RCOG guideline (2009) advises weight specific dosage on thromboprophylaxis. (Refer to Appendix B)

4.6 Obese women with a body mass index (BMI) of 35 or more are unsuitable for midwife-led care, and should be seen in pregnancy by a consultant obstetrician. (Refer to the guideline entitled 'Management with a pregnant patient with a raised BMI'; register number 05092)

4.7 Vulnerable women, such as those with mental illness or learning disability, are less compliant, and may not be able to follow advice or self inject, and so require particular care. Antipsychotic medication may be associated with weight gain, which may put the woman at increased risk of thromboembolism.

4.8 Women are at risk of thromboembolism from the very early pregnancy until the end of the puerperium, and all health professionals must be aware of this. Early pregnancy units and gynaecology wards must carry out risk assessment appropriate for pregnant women.

4.9 Women with a high or very high risk of VTE should be seen by consultant obstetrician or discussed with consultant obstetrician.

4.10 Women who require thromboprophylaxis need an individual management plan at all stages of pregnancy. The patient's healthcare records must clearly document dose and duration of treatment.

4.11 Women who are on pharmacological antenatal thromboprophylaxis require anaesthetic referral to discuss individual plans for intrapartum and delivery analgesic options.

4.12 Women who fall in the 'very high risk group' require management by a specialist multidisciplinary team including haematologist, obstetrician, midwife and anaesthetist.

4.13 Women at high risk of VTE in pregnancy, such as those with previous VTE, should be offered pre-pregnancy counselling and a prospective management plan for thromboprophylaxis in pregnancy.

4.14 Women who become pregnant before receiving such counselling should be referred to a consultant obstetrician or trust-nominated expert in thrombosis in pregnancy early in pregnancy.

4.15 Women with a previous non-oestrogen-related VTE provoked by a minor risk factor should undergo testing for thrombophilia, as this will influence management and decisions regarding thromboprophylaxis antenatally.

4.16 Low molecular weight heparins (LMWH) are the agents of choice for antenatal thromboprophylaxis. All pregnant women, at risk of VTE, should be offered Clexane, unless contraindicated. These are at least as effective as and safer than unfractionated heparin.

4.17 The use of aspirin is not recommended for VTE prophylaxis in any patient group.

4.18 Regardless of their risk of VTE, all women should be encouraged to mobilise during labour and postpartum. Dehydration should be avoided.

4.19 Elective induction of labour may be indicated in some women (particularly those on high-dose prophylactic or treatment doses of Clexane) to help plan Thromboprophylaxis around delivery

4.24 Women receiving LMWH antenatally should usually continue prophylactic doses of LMWH until 6 weeks postpartum but a postnatal risk assessment should be made.

4.25 If they are receiving long-term anticoagulation with warfarin, this can be started when the risk of haemorrhage is low.

4.26 Both warfarin and LMWH are safe when breastfeeding. Women should be repeatedly assessed for risk factors for VTE if they develop intercurrent problems or require surgery or readmission in the puerperium.

5.0 Antenatal VTE Risk Assessment and Management

5.1 All women should have a documented VTE risk assessment as stated in section 4. Those identified at risk should be offered thromboprophylaxis, according to their level of risk as defined in this section and the appropriate appendices.

5.2 For risk assessment, see table for summary of risk assessment Table F

The tables in green top guideline 37a appendices II, III, IV and V) provide criteria for assigning a woman's level of risk and gives recommendations for their management.

5.3 Very High Risk

One of the following risk factors: Requires higher-dose LMWH Prophylaxis dose 12 hourly or weight adjusted 75% of treatment dose (Refer to Appendix B) Continue for 6 weeks postpartum or until converted back to Warfarin Seeks obstetric and haematology consultant opinion
Previous recurrent VTE with antithrombin deficiency
Previous recurrent VTE with antiphospholipid antibody syndrome (APS)

5.4 High Risk

One of the following risk factors: Requires antenatal LMWH prophylaxis Requires postpartum LMWH for 6 weeks
Single previous VTE & thrombophilia (congenital or acquired)
Single previous VTE & family history of VTE in first degree relative
Single previous VTE due to unprovoked or idiopathic
Acquired thrombophilia (Antiphospholipid syndrome) • Lupus anticoagulant/ anticardiolipin/ β2-glycoprotein1 antibodies –

medium or high titre (persistently positive) Associated with one of the following medical or obstetric history • History of arterial or venous thrombosis • Adverse pregnancy outcome (3 or more unexplained miscarriage before 10 weeks/ a fetal death after 10 weeks of gestation/ a premature birth < 35 weeks due to severe pre-eclampsia or IUGR Compound heterozygotes • Those with other additional risk factors
Single previous VTE due to estrogen related (contraceptive pills) or pregnancy related
Previous recurrent VTE (>1)
Asymptomatic heritable

5.5 **Intermediate risk**

One of the following risk factors: Require close surveillance for development of other risk factors Antenatal LMWH is not routinely recommended Consider antenatal LMWH prophylaxis (discuss with consultant) Requires postpartum LMWH after risk assessment	
Single previous VTE with no family history of VTE	
Single previous VTE with no thrombophilia	
Congenital thrombophilia with no history of VTE • Protein C deficiency • Protein S deficiency • Factor V Leiden – heterozygous • Prothrombin G20210A – heterozygous	
Acquired thrombophilia with no history of VTE (persistent antiphospholipid antibody) • Lupus anticoagulant/ anticardiolipin/ β2-glycoprotein1 antibodies – medium or high titre on 2 occasions 12 weeks apart • No previous VTE, no other risk factors or fetal indications	
Medical comorbidity • heart disease, lung disease • SLE, inflammatory conditions, nephrotic syndrome, sickle cell disease • intravenous drug users • cancer	
Surgical procedures	e.g. appendectomy

5.6 **Intermediate risk**

3 or more following risk factors (refer to point 5.8)
2 or more following risk factors if admitted (refer to point 5.8)
Require close surveillance for development of other risk factors, Antenatal LMWH is not routinely recommended Consider antenatal LMWH prophylaxis (seek expert advice) Requires postpartum LMWH; duration of LMWH depends on risk assessment postnatally

5.7 **Low risk**

Less than 3 following risk factors (refer to point 5.8)
Mobilisation and avoidance of dehydration

5.8 **Risk factors**

Age > 35 years
BMI > 30
Family history of VTE in first degree relative
Parity ≥ 3
Smoker
Gross varicose vein
Current systemic infection
Admission or Immobility (≥ 3 days bed rest), e.g. Paraplegia, SPD, long-distance travel (>4 hours)
Pre-eclampsia
Dehydration / Hyperemesis / OHSS
Multiple pregnancy or ART

5.9 **Initial dose of antenatal thromboprophylaxis**
If a decision is made to initiate antenatal thromboprophylaxis, this should begin as early in pregnancy as practical.

5.10 **If objective documentation of previous VTE is not available**, the previous history of VTE can be assumed
- When the woman gives a good history and
- She received prolonged therapeutic anticoagulation (more than 6 weeks)

5.11 **Methods for antenatal thromboprophylaxis**

Low-molecular-weight heparin
- LMWH's are the agents of choice for antenatal thromboprophylaxis. They are at least as effective as and safer than unfractionated heparin.

Unfractionated heparin
- Unfractionated heparin has a shorter half-life than LMWH and there is more complete reversal of its activity by protamine sulphate.

It may be used in following conditions:

- Around the time of delivery in women at very high risk of thrombosis
- In women at increased risk of haemorrhage
- In women with renal failure

Low-dose aspirin
- The use of aspirin is not recommended for VTE prophylaxis in any patient group.
- Aspirin is recommended for all women with antiphospholipid syndrome to improve fetal outcomes. There were no adverse fetal outcomes reported in the trials of low-dose aspirin for prevention of pre-eclampsia in pregnancy.

Graduated elastic compression stockings

- Use of properly applied thigh-length stockings are recommended in pregnancy and puerperium but knee-length stockings should be considered if (as is often the case) full-length stockings are ill fitting or compliance is poor.

5.12 **Testing of thrombophilia in women with prior VTE**

- The test should be offered if previous VTE was provoked by a temporary minor risk factor (e.g. long distance travel)
- The test is not required for women with a prior unprovoked or estrogen provoked VTE, because obviously, these women should be considered for thromboprophylaxis. The test result would not alter the proposed management.
- It is important to be aware of the effects of pregnancy on the results of thrombophilia tests. In particular, protein S levels are reduced by pregnancy.

6.0 Postpartum VTE Risk Assessment and Thromboprophylaxis

6.1 All women require VTE risk assessment **following delivery** and before discharge; and arrangements made for LMWH prescription and administration (usually by the woman herself) in the community where necessary.

6.2. For VTE risk assessment, see table for summary of risk assessment and see – for risk assessment in details

6.3 **High risk**

One of the following risk factors: Requires at least 6 weeks postnatal prophylactic LMWH
Any previous VTE
Anyone requiring antenatal LMWH

6.4 **Intermediate risk**

One of the following risk factors: Requires at least 7 days postnatal prophylactic LMWH
Caesarean section
Asymptomatic thrombophilia (inherited or acquired)
BMI > 40 kg/m2
Prolonged hospital admission > 3days
MEDICAL COMORBIDITIES, e.g. • Heart or lung disease • SLE, inflammatory conditions, nephrotic syndrome, sickle cell disease • intravenous drug user • cancer

6.5 High Risk if persisting or > 3 of the risk factors listed in 6.8 or at least 6 weeks postnatal prophylactic LMWH

6.6 Intermediate Risk ≥2 of the risk factors listed in 6.8 or at least 7 days postnatal prophylactic LMWH

6.7 Low Risk < 2 of the risk factors listed in 6.8 or mobilisation and avoidance of dehydration.

6.8 **Risk factors**

Age > 35 years
Obesity (BMI > 30kg/m2)
Family history of VTE in first degree relative
Parity ≥ 3
Smoker
Caesarean section
Any surgical procedure in the puerperium
Gross varicose veins
Current systemic infection
Immobility, e.g. paraplegia, SPD, long distance travel
Pre-eclampsia
Mid-cavity rotational operative delivery
Prolonged labour (> 24 hours)
PPH > 1 litre or blood transfusion

6.9 The first thromboprophylactic dose of LMWH should be given as soon as possible after delivery provided that there is no postpartum haemorrhage (but see precautions after use of regional anaesthesia)

6.10 If there has been regional analgesia, in which case LMWH should be given by 4 hours after delivery or 4 hours after removal of the epidural catheter, if it is removed immediately or shortly after delivery.

6.11 If the epidural catheter is left in place after delivery for the purpose of postpartum analgesia, it should be removed 12 hours after a dose and 4 hours before the next dose of LMWH.

6.12 In women who have additional persistent (lasting more than 7 days postpartum) risk factors, such as prolonged admission or wound infection, extend the 7-day period of thromboprophylaxis for up to 6 weeks or until the additional risk factors are no longer present.

6.13 **Methods for postpartum thromboprophylaxis:**

- LMWH is appropriate for postpartum thromboprophylaxis
- Both warfarin and LMWH are safe when breast feeding.
- If women are receiving long term anticoagulation, warfarin may be preferable, Conversion from LMWH to warfarin should be delayed for at least 5–7 days after delivery to minimise the risk of haemorrhage during the period of overlap of LMWH and warfarin treatment. (see guideline 12007)

7.0 Staff and Training

7.1 All qualified midwifery and obstetric staff are fully trained to perform an initial assessment antenatally and to inform the appropriate multidisciplinary members as necessary. Qualified staff should assist midwifery and medical trainee's to learn how to assess and identify women who may require thrombophrophylaxis as part of their education and skills where appropriate to ensure safe competent practitioner.

7.2 All midwifery and obstetric staff must attend yearly mandatory training which includes skills and drills training.

7.3 All midwifery and obstetric staff are to ensure that their knowledge and skills are up-to date in order to complete their portfolio for appraisal.

8.0 Supervisor of Midwives

8.1 The supervision of midwives is a statutory responsibility that provides a mechanism for support and guidance to every midwife practising in the UK. The purpose of supervision is to protect women and babies, while supporting midwives to be fit for practice'. This role is carried out on our behalf by local supervising authorities. Advice should be sought from the supervisors of midwives are experienced practising midwives who have undertaken further education in order to supervise midwifery services. A 24 hour on call rota operates to ensure that a Supervisor of Midwives is available to advise and support midwives and women in their care choices.

9.0 Infection Prevention

9.1 All staff should follow Trust guidelines on infection prevention by ensuring that they effectively 'decontaminate their hands' before and after each procedure and when taking bloods samples to use the Aseptic Non –Touch Technique (ANTT).

10.0 Audit and Monitoring

10.1 Audit of compliance with this guideline will be considered on an annual audit basis in accordance with the Clinical Audit Strategy and Policy, the Maternity annual audit work plan and the NHSLA/CNST requirements. The Audit Lead in liaison with the Risk Management Group will identify a lead for the audit.

10.2 As a minimum the following specific requirements will be monitored:

- Appropriate and timely risk assessments to identify those at risk of VTE
- Significance of signs and symptoms in light of known risk factors
- Actions to be taken in response to the risk assessments once the risk of VTE has been identified
- Requirement to document an individual management plan in the health care records of women who require thromboprophylaxis or treatment for a diagnosis of VTE
- Thromboprophylaxis during pregnancy
- Care during labour and delivery of women on thromboprophylaxis
- Thromboprophylaxis during the postnatal period
- Management of massive life threatening pulmonary thromboembolism in pregnancy
- Process for offering a postnatal appointment with an appropriate clinician to all women who have been have been diagnosed with VTE during pregnancy or the postnatal period

10.3 A review of a suitable sample of health records of patients to include the minimum requirements as highlighted in point 10.2 will be audited. A minimum compliance 75% is required for each requirement. Where concerns are identified more frequent audit will be undertaken.

10.4 The findings of the audit will be reported to and approved by the Maternity Risk Management Group (MRMG) and an action plan with named leads and timescales will be developed to address any identified deficiencies. Performance against the action plan will be monitored by this group at subsequent meetings.

10.5 The audit report will be reported to the monthly Maternity Directorate Governance Meeting (MDGM) and significant concerns relating to compliance will be entered on the local Risk Assurance Framework.

10.6 Key findings and learning points from the audit will be submitted to the Patient Safety Group within the integrated learning report.

10.7 The audit report will be shared with the Hospital Thrombosis Group

10.8 Key findings and learning points will be disseminated to relevant staff.

11.0 Guideline Management

11.1 As an integral part of the knowledge, skills framework, staff are appraised annually to ensure competency in computer skills and the ability to access the current approved guidelines via the Trust's intranet site.

11.2 Quarterly memos are sent to line managers to disseminate to their staff the most currently approved guidelines available via the intranet and clinical guideline folders, located in each designated clinical area.

11.3 Guideline monitors have been nominated to each clinical area to ensure a system whereby obsolete guidelines are archived and newly approved guidelines are now downloaded from the intranet and filed appropriately in the guideline folders. 'Spot checks' are performed on all clinical guidelines quarterly.

11.4 Quarterly Clinical Practices group meetings are held to discuss 'guidelines'. During this meeting the practice development midwife can highlight any areas for further training; possibly involving 'workshops' or to be included in future 'skills and drills' mandatory training sessions.

12.0 Communication

12.1 A quarterly 'maternity newsletter' is issued and available to all staff including an update on the latest 'guidelines' information such as a list of newly approved guidelines for staff to acknowledge and familiarise themselves with and practice accordingly.

12.2 Approved guidelines are published monthly in the Trust's Focus Magazine that is sent via email to all staff.

12.3 Approved guidelines will be disseminated to appropriate staff quarterly via email.

12.4 Regular memos are posted on the guideline notice boards in each clinical area to notify staff of the latest revised guidelines and how to access guidelines via the intranet or clinical guideline folders.

13.0 References

Royal College of Obstetrician and Gynaecologists; Reducing the risk of thrombosis & embolism during pregnancy & puerperium; Green-top Guideline No. 37a; November 2009

National Institute of Clinical Excellence; Reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in patients admitted to hospital; updated NICE clinical guideline 46, January 2010

BJOG An International Journal of Obstetrics and Gynaecology; Centre for Maternal and Child Enquiries; Saving Mothers' Lives; Reviewing maternal deaths to make motherhood safer: 2006–2008; Volume 118, Supplement 1, March 2011

Clinical Negligence Scheme for Trusts; Maternity; Clinical Risk Management Standards Version 1; 2012/13

Appendix A

Low Molecular Weight Heparin

A.1 LMWHs are the agents of choice for antenatal thromboprophylaxis. They are at least as effective as and safer than unfractionated heparin.

A.2 Doses of LMWH for thromboprophylaxis are based on booking weight.

A.3 Monitoring of anti-Xa levels is not required when LMWH is used for thromboprophylaxis, provided that the woman has normal renal function.

A.4 Lower doses of enoxaparin and dalteparin should be employed if the creatinine clearance is less than 30 ml/minute. This would equate to a serum creatinine of about 200 µmol/ l for a 30-year-old woman weighing 70 kg.

A.5 A higher prophylactic doses or therapeutic doses of LMWH may be appropriate, in antithrombin deficiency, higher doses of LMWH (weight-adjusted: either 75% or 100% of treatment dose) may be necessary, as judged by anti-Xa levels and monitoring should be by a haemostasis expert

A.6 Antenatal period the therapeutic dose should be LMWH- 1mg/kg12 hourly(as documented by RCOG), Daltaparin 100iu/kg12 hourly or Tinzaparin 175iu/kgdaily. (page 21.p 8.1 GTguideline 37a)

Contraindications to LMWH

LMWH should be avoided, discontinued or postponed in women who are risk of bleeding after careful consideration of the balance of risks of bleeding and clotting. Risk factors for bleeding are:

- women with active antenatal or postpartum bleeding
- women considered at increased risk of major haemorrhage (such as placenta praevia)
- women with a bleeding diathesis, such as von Willebrand's disease, haemophilia or acquired coagulopathy
- women with thrombocytopenia (platelet count less than 75 x 109)
- acute stroke in the last 4 weeks (ischaemic or haemorrhagic)
- severe renal disease (glomerular filtration rate less than 30 ml/minute/1.73 m2)
- severe liver disease (prothrombin time above normal range or known varices)
- uncontrolled hypertension (blood pressure greater than 200 mmHg systolic or greater than 120 mmHg diastolic).

Appendix B

Antenatal and Postnatal Prophylactic Dose of LMWH

Weight	Enoxaparin	Dalteparin	Tinzaparin	
< 50 kg	20 mg	2500 units	3500 units	daily
50–90 kg	40 mg	5000 units	4500 units	daily
91–130 kg	60 mg *	7500 unit *	7000 unit *	daily
131–170 kg	80 mg *	10000 unit *	9000 unit *	daily
> 170 kg	0.6 mg/kg/day *	75 units/kg/day *	75 units/kg/day *	

High prophylactic (intermediate) dose for very high risk group (for women weighing 50-90 Kg)

- 40 mg enoxaparin 12-hourly or
- 5000 iu dalteparin 12-hourly, or
- tinzaparin 4500 iu 12-hourly

Therapeutic dose subcutaneous LMWH (antenatal):

- 1 mg/kg enoxaparin 12-hourly or
- 100 iu/kg dalteparin 12-hourly or
- tinzaparin 175 iu/kg daily

Therapeutic dose subcutaneous LMWH (postnatal):

- 1.5 mg/kg enoxaparin daily or
- 200 u/kg dalteparin daily or
- tinzaparin 175 u/kg daily

***may be given in two divided doses**

Appendix C

Unfractionated Heparin

Unfractionated heparin has a shorter half-life than LMWH and there is more complete reversal of its activity by protamine sulphate.

It may be used in following conditions

- Around the time of delivery in women at very high risk of thrombosis (when there may be reluctance to use LMWH in case regional anaesthetic techniques are required)
- In women at increased risk of haemorrhage
- In women with renal failure

A prophylactic dose of 5000 iu subcutaneously of unfractionated heparin could be used and repeated every 12 hours until LMWH can be resumed after delivery

The required interval between a prophylactic dose of unfractionated heparin and regional analgesia or anaesthesia is less (4 hours) than with LMWH (12 hours)

There is less concern regarding neuraxial haematomas with unfractionated heparin.

Any exposure to unfractionated heparin is associated with an increased risk of heparin induced thrombocytopenia.

Appendix D

Graduated Elastic Compression Stockings

Use of properly applied thigh-length stockings are recommended in pregnancy and puerperium but knee-length stockings should be considered if (as is often the case) full-length stockings are ill fitting or compliance is poor.

Indications for anti-embolism stockings in pregnancy and the puerperium

- those who are hospitalised and have a contraindication to LMWH
- those who are hospitalised post-caesarean section (combined with LMWH) and considered to be at particularly high risk of VTE (such as previous VTE, more than three3 risk factors)
- outpatients with prior VTE (usually combined with LMWH)
- travelling long distance for more than 4 hours.
- symptomatic DVT, patients should wear a tighter-fitted stocking during the day, with an ankle pressure gradient of 30–40 mmHg for 2 years to prevent the post-thrombotic syndrome (and continue for longer if post-thrombotic symptoms are present).

Do not offer anti-embolism stockings to patients who have:

- suspected or proven peripheral arterial disease
- peripheral arterial bypass grafting
- peripheral neuropathy or other causes of sensory impairment
- any local conditions in which stockings may cause damage, for example fragile ‘tissue paper’ skin, dermatitis, gangrene or recent skin graft
- known allergy to material of manufacture
- cardiac failure
- severe leg oedema or pulmonary oedema from congestive heart failure
- unusual leg size or shape
- major limb deformity preventing correct fit

Use caution and clinical judgement when applying anti-embolism stockings over venous ulcers or wounds

Ensure that patients who develop oedema or postoperative swelling have their legs re-measured and anti-embolism stockings refitted. Use anti-embolism stockings that provide graduated compression and produce a calf pressure of 14–15 mmHg.

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

Remove anti-embolism stockings daily for hygiene purposes and to inspect skin condition. In patients with a significant reduction in mobility, poor skin integrity or any sensory loss, inspect the skin two or three times per day, particularly over the heels and bony prominences.

Discontinue the use of anti-embolism stockings if there is marking, blistering or discolouration of the skin, particularly over the heels and bony prominences, or if the patient experiences pain or discomfort. If suitable, offer a foot impulse or intermittent pneumatic compression device as an alternative.

Appendix E

Assessment of Bleeding Risk

Assess all patients for risk of bleeding before offering pharmacological VTE prophylaxis.

Do not offer pharmacological VTE prophylaxis to patients with any of the risk factors for bleeding shown below, unless the risk of VTE outweighs the risk of bleeding**.**

Women at high risk of haemorrhage may be more conveniently managed with unfractionated heparin or graduated compression stockings.

If a woman develops a haemorrhagic problem while on LMWH, the treatment should be stopped and expert haematological advice sought.

It should be remembered that excess blood loss and blood transfusion is a risk factor for VTE, so thromboprophylaxis should be begun or reinstituted as soon as the immediate risk of haemorrhage is reduced.

For women with an identified bleeding risk, the balance of risks of bleeding and clotting should be discussed in consultation with a haematologist with experience of thrombosis and bleeding in pregnancy

Risk factors of bleeding
Haemophilia or other known bleeding disorder (e.g. von Willebrand's disease or acquired coagulopathy)
Active antenatal or postpartum bleeding
Women considered at increased risk of major haemorrhage (e.g. placenta praevia)
Thrombocytopenia (platelet count < 75 ×109)
Acute stroke in previous 4 weeks (haemorrhagic or ischaemic)
Severe renal disease (glomerular filtration rate < 30 ml/minute/1.73 m2)
Severe liver disease (prothrombin time above normal range or known varices)
Uncontrolled hypertension (blood pressure > 200 mmHg systolic or > 120 mmHg diastolic)
Concurrent use of anticoagulants (such as warfarin with INR higher than 2)

Obstetric Thromboprophylaxis Risk Assessment & Management

Table 1: Obstetric thromboprophylaxis risk assessment and management (including early pregnancy complications in gynaecological ward)

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Antenatalthromboprophylaxis risk assessment and management

Previous recurrent VTE with □Antithrombin deficiency or □Antiphospholipid antibody syndrome	Very high risk Requires higher dose antenatal LMWH Refer to haemalologist
□Single previous VTE+ • Thrombophilia or family history • Unprovoked/estrogen-related □Previous recurrent VTE	High risk Requires antenatal prophylaxis with LMWH
□Single previous VTE with no family history or thrombophilia □Thrombophilia + no VTE □MEDICAL COMORBIDITIES, e.g. heart or lung disease, SLE, cancer, inflammatory conditions, nephrotic syndrome, sickle cell disease, □intravenous drug user □Surgical procedure, e.g. appendicetomy	Intermediate risk Requires close surveillance for development of other risk factors, Antenatal LMWH is not routinely recommended Consider antennal prophylaxis with LMWH, seek consultant advice
□Age >35 years □BMI > 30 kg/m2 □Parity ≥ 3 □Smoker □Gross varicose veins □Immobility,e.g. paraplegia, SPD □Long distance travel ≥ 4 hours □Pre-eclampsia □Dehydration/hyperemesis/ OHSS □Multiple pregnancy or ART	3 or more risk factors 2 or more if admitted < 3 risk factors Lower risk Mobilisation and avoidance of dehydration

Antenatal and postnatal prophylactic dose of LMWH			High prophylactic/ intermediate dose
Weight	**enoxaparin**		□ Weight 50 – 90 kg 40 mg enoxaparin 12 hourly □ 75% of therapeutic dose (enoxaparin 1 mg/kg 12 hourly)
□< 50 kg	20 mg	daily	
□ 50 – 90 kg	40 mg	daily	
□ 91 – 130 kg	60 mg	daily	
□ 131 – 170 kg	80 mg	daily	
□> 170 kg	0.6 mg/kg/day		

Postnatal thromboprophylaxis risk assessment and management

□Any previous VTE □Anyone requiring antenatal LMWH	High risk At least 6 weeks postnatal prophylaxis LMWH
□ Caesarean section □Asymptomatic thrombophilia (inherited or acquired) □BMI > 40 KG/M2 □ Hospital admission ≥ 3 days □MEDICAL COMORBIDITIES, e.g. heart or lung disease, SLE, cancer, inflammatory conditions, nephrotic syndrome, sickle cell disease, □intravenous drug user	Intermediate risk At least 7 days postnatal prophylaxiic LMWH Note: if persisting or > 3 risk factors, consider extending prophylaxis with LMWH
□ Age > 35 years □ BMI > 30 kg/m2 □ Parity ≥ 3 □ Smoker □Any surgical procedure in puerperium □ Gross varicose vein □ Current systemic infection □Inmobility, e.g. paraplegia, SPD, long distance travel > 4 hours □ Pre-eclampsia □Mid cavity rotational operative delivery □Prolonged labour > 24 hours □ PPH > 1 litre or blood transfusion	2 or more risk factors < 2 risk factors Lower risk Mobilisation and avoidance of dehydration

Patient Name_____

Hospital Number_____

Risk Assessor's Name_____

Signature_____ ___ Date_____

Obstetric thromboprophylaxis risk assessment and management (including early pregnancy complication in Gynaecological ward)

Mid EssexHospital Services NHS Trust

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- Above and the following tables are for guidance only and not exhaustive lists
- Thromboprophylaxis assessment and management in details – in the guideline 08014, Appendix A and Appendix B
- Ensure good hydration and mobilisation for all antenatal, intra partum and postnatal women

Key

ART = assisted reproductive therapy
BMI = bases on booking weight
Gross varicose vein = symptomatic, above knee, associated with phlebitis, oedema, skin changes,
LMWH + low molecular weight heparin
OHSS =ovarian hyperstimutation syndrome
SPD = symphysis pubis dysfunction

Note: to assess risk of bleeding before prescribing LMWH

Risk factors for bleeding

- Haemophilia or other known bleeding disorder (e.g. von Willebrand's disease or acquired coagulopathy)
- Active antenatal or postpartum bleeding
- Women considered at increased risk of major haemorrhage (e.g. placenta praevia)
- Thrombocytopenia (platelet count < 75 ×109)
- Acute stroke in previous 4 weeks (haemorrhagic or ischaemic)
- Severe renal disease (glomerular filtration rate < 30 ml/minute/1.73 m2)
- Severe liver disease (prothrombin time above normal range or known varices)
- Uncontrolled hypertension (blood pressure > 200 mmHg systolic or > 120 mmHg diastolic)
- Concurrent use of anticoagulants (such as warfarin with INR higher than 2)

Anti-embolism stocking

Indications for anti-embolism stockings in pregnancy and the puerperium

- who are hospitalised and have a contraindication to LMWH
- who are hospitalised post-caesarean section (combined with LMWH)
- who arerisk of VTE (such as previous VTE, more than three3 risk factors)
- outpatients with prior VTE (usually combined with LMWH)
- travelling long distance for more than 4 hours.
- symptomatic DVT, patients should wear a tighter-fitted stocking during the day, with an ankle pressure gradient of 30–40 mmHg for 2 years to prevent the post-thrombotic syndrome (and continue for longer if post-thrombotic symptoms are present).

Do not offer anti-embolism stockings to women who have

- suspected or proven peripheral arterial disease
- peripheral arterial bypass grafting
- peripheral neuropathy or other causes of sensory impairment
- any local conditions in which stockings may cause damage, for example fragile 'tissue paper' skin, dermatitis, gangrene or recent skin graft
- known allergy to material of manufacture
- cardiac failure
- severe leg oedema or pulmonary oedema from congestive heart failure
- unusual leg size or shape
- major limb deformity preventing correct fit