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Thromboprophylaxis during pregnancy, labour and puerperium *Maternity Manual* guideline

Version: 3

Date of Issue: January 2012

Review Date: January 2015

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Approved on: January 2012

Approved By: *Obstetric & Gynaecology & Sexual Health Governance Committee*

Distribution to: All clinical staff working within the MCHFT Maternity Service

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THROMBOPROPHYLAXIS DURING PREGNANCY, LABOUR AND PUERPERIUM

1. INTRODUCTION

1.1 Venous thromboembolism remains a leading direct cause of maternal death in the UK. In the Confidential Enquiry into Maternal Death and Child Health 2003-2005 report, 41 women died as a result of thrombosis and thromboembolism.

1.2 Of those 41 women, 33 deaths were attributed to pulmonary embolism (1.56/100 000 maternities) (CEMACH 2007). The remaining eight deaths were attributed to cerebral vein thrombosis.

1.3 Many antenatal venous thromboembolism (VTE) events occur in the first trimester and therefore, prophylaxis should begin early in pregnancy (Blanco-Molina et al). The highest risk period for VTE, and pulmonary embolism in particular is during the postpartum period (Pomp et al 2008). Caesarean section is a significant risk factor but women having vaginal deliveries are also at risk and 55% (25/45) of the postpartum maternal deaths from VTE in the UK between 1997 and 2005 occurred in women who had delivered vaginally (CEMACH 2007).

1.4 This guideline reviews the risk factors for VTE in pregnancy and the puerperium and provides guidance as to which women require thromboprophylaxis during and after pregnancy.

1.5 For the management of women with suspected or confirmed VTE, please refer to the Guideline *Diagnosis and Management of Venous Thromboembolism during Pregnancy and in the Puerperium.*

2. THROMBOPROPHYLAXIS DURING PREGNANCY, LABOUR AND PUERPERIUM

2.1 Pre-pregnancy

- Women at high risk of VTE in pregnancy, such as those with previous VTE, should be offered pre-pregnancy counselling, which should be arranged via their own GP, including a discussion of the significance of signs and symptoms (see Guideline Diagnosis and Management of Venous Thromboembolism during Pregnancy and in the Puerperium) and a prospective management plan should be made for thromboprophylaxis in pregnancy. Those who become pregnant before receiving such counselling should be referred to a consultant obstetrician early in pregnancy.

- 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 (RCOG 2009).

- Individuals with recurrent VTE may be on long-term warfarin. Women should be counselled by the Haematologist about the risks of warfarin and change to LMWH either pre-pregnancy or as soon as pregnancy is confirmed.

- The risk of VTE should be discussed with women at risk and the reasons for individual recommendations explained by the Haematologist.

2.2 Antenatal period

- An individual assessment of VTE risk will be undertaken by the midwife/obstetrician at the booking visit using the VTE Risk Assessment Tool (see Frequently Used Forms). If the woman is identified to be at high risk of VTE disease she should be referred to Consultant Led Care. An individualised plan of care will be decided by the Obstetrician and documented in the woman's handheld notes and hospital health records on the risk assessment proforma.

- Antenatal thromboprophylaxis should begin as early in pregnancy as is practicable.

- The woman's early booking weight must be recorded on all prescriptions for LMWH in order for the pharmacy to confirm the correct dosage.

- All women but especially those deemed at risk of VTE should be encouraged to avoid long periods of immobilisation, such as long haul flights and becoming dehydrated. The use of compression stockings should be considered for pregnant women if travelling by air or for high risk women during the pregnancy and puerperium.

- For all women receiving antenatal thromboprophylaxis, regular antenatal follow up in the ANC is required to discuss and review plan of care. If any problems arise consultation with the Consultant Haematologist may be necessary.

- Women with a previous DVT, prophylactic treatment prior to pregnancy, a previously diagnosed thrombophilia or receiving a *therapeutic* dose of LMWH for any reason will be referred to the Consultant Haematologist by the Obstetrician in the form of a letter for antenatal assessment and plan of care. Women on prophylactic LMWH due to risk factors will not necessarily need Haematologist review.

- Any woman receiving LMWH in the antenatal period will be referred for a Consultant Anaesthetic opinion via the agreed proforma.

- All women commencing LMWH will have their platelet count checked after two weeks if they have previously been treated with unfractionated heparin, as well as at booking, 28 weeks and 34 weeks.

- Any pregnant woman admitted to hospital at any gestation will have an antenatal VTE risk assessment completed. If she falls into a high risk group she must be commenced on an appropriate dose of LMWH unless contraindications are present. This risk assessment must be reviewed every 24 hours during the admission. The woman's early booking weight must be recorded on the drug chart in order for the pharmacy to confirm the correct dosage. The need for ongoing LMWH will be reviewed on discharge.

Any woman who is admitted to the Delivery Suite/ A&E department/Triage Unit with any symptoms suspicious of VTE disease MUST have therapeutic treatment commenced until proven otherwise (see Guideline for the Diagnosis and Management of VTE).

2.3 Intrapartum

- Any woman on antenatal LMWH should be informed to contact Delivery Suite as soon as she thinks she is in labour. No further LMWH is to be injected until she has been assessed on Delivery Suite/Triage to confirm whether labour has commenced or not.

- If induction of labour or elective Caesarean Section is to be undertaken the dose of LMWH will be stopped 24 hours before the procedure is planned unless there are alternative instructions from the woman's consultant or haematologist.

- For women receiving high prophylactic or therapeutic doses of LMWH, the dose should be reduced to its thromboprophylactic dose on the day before induction of labour and, if appropriate, continued in this dose during labour.

- The decision to continue LMWH during labour should be decided by a consultant obstetrician and haematologist and a plan of care documented in the health records during the Antenatal period.

- Epidural anaesthesia is not recommended for at least 12 hours following a prophylactic LMWH dose, or if on therapeutic dose for at least 24 hours. LMWH should not be given for at least 4 hours but preferably **6 hours** after the epidural insertion, and the epidural catheter should not be removed for 12 hours from the most recent injection.

- In the instance of a 'bloody tap' the dose of LMWH should be delayed for 24 hours. The anaesthetist should document this clearly in the notes in the postnatal section**.** Guidance should be sought from a senior anaesthetist if any problems are encountered.

- For **all** women once labour is diagnosed an intrapartum risk assessment will be completed by the midwife caring for her to identify women deemed high risk in labour.

2.4 Postnatal

- **All women** should have a VTE risk assessment form completed postnatally **and if necessary the appropriate dose of LMWH prescribed before** they are transferred from delivery suite.

- There is increased risk of wound haematoma of around 2% with LMWH. Antepartum and postpartum haemorrhage including blood transfusion is a risk factor for VTE. Thromboprophylaxis should be instituted as soon as immediate risk of haemorrhage is reduced.

- All women who have had an emergency caesarean section should be given thromboprophylaxis with LMWH for 7 days after delivery.

- Women with VTE before the current pregnancy should be given LMWH for 6 weeks following delivery.

- Women receiving LMWH antenatally should continue prophylactic doses of LMWH until 6 weeks postpartum.

- When thromboprophylaxis is required postnatally for 7 days, LMWH is to be used. If LMWH is prescribed for 6 weeks or more postnatally, a platelet count must be checked after 2 weeks if the woman has previously been treated with unfractionated heparin.

- For women who require longer term anticoagulation, warfarin may be prescribed from day 3 postnatally following discussion with the woman as regular follow up is required to monitor INR levels. (Refer to hospital guidelines on initiation of warfarin available on the intranet**.)**

- Both warfarin and LMWH are safe when breastfeeding.

- Prior to discharge from hospital the plan of care for women who require long term anticoagulation must be made by the Obstetric team regarding appropriate post-natal follow-up with the Anti-Coagulation Team.

- Any outpatient appointments will be made in consultation with the consultant Haematologist prior to transfer to community. All women diagnosed with VTE during pregnancy or the post natal period are offered a follow up appointment at the Trust's Haematology Clinic prior to discharge. The referral is made by the obstetrician by phone/referral letter and documented in the health records.

2.5 (Table 1) Risk factors for Venous Thromboembolism in pregnancy and puerperium

Pre-existing:	Previous VTE, thrombophilia: Heritable: • Antithrombin deficiency • Protein C deficiency • Protein S deficiency • Factor V Leiden • Prothrombin gene G20210A Acquired (antiphospholipid syndrome): • Persistent lupus anticoagulant • Persistent moderate/high-titre anticardiolipin antibodies or β2 glycoprotein 1 antibodies Medical co morbidities (e.g. heart or lung disease, SLE, cancer, inflammatory conditions inflammatory bowel disease, nephrotic syndrome (proteinuria > 3 g/day)): • sickle cell disease • intravenous drug user • Age > 35 years • Obesity (BMI > 30 kg/m2) • Parity ≥ 3 • Smoking • Gross varicose veins (symptomatic or above knee or with associated phlebitis) • Paraplegia
Obstetric:	o Multiple pregnancy o Pre-eclampsia o Caesarean section o Prolonged labour, mid-cavity rotational or operative delivery o PPH (> 1 litre) requiring transfusion
New-onset /transient:	❖ Surgical procedure in pregnancy or puerperium (e.g. ERPC, appendicectomy, postpartum sterilisation)
Potentially reversible:	➢ Hyperemesis, Dehydration ➢ Ovarian hyperstimulation syndrome ➢ Admission or immobility (≥ 3 days' bed rest) e.g. symphysis pubis dysfunction restricting mobility ➢ Systemic infection (requiring antibiotics or admission to hospital) e.g. pneumonia, pyelonephritis, postpartum wound infection ➢ Long-distance travel (> 4 hours)

2.5.1 Management of women with previous VTE:

- Women with previous VTE have an increased risk of recurrence in pregnancy and postpartum with reported rates of 1.4 – 11.1% (Pabinger I et al 2005).

  Intermediate risk - Women with a previous single provoked (excluding oestrogen-related) VTE and no other risk factors require close surveillance for development of other risk factors. Antenatal LMWH is not routinely recommended. They should be offered thromboprophylaxis with LMWH for 6weeks postpartum**.**

  High Risk - Women in whom previous VTE was unprovoked or related to oestrogen (pregnancy/oestrogen containing contraception), or who have other risk factors, a family history of VTE in a first-degree relative (suggestive of thrombophilia) or a documented thrombophilia. These women should be offered antenatal thromboprophylaxis with LMWH and for 6 weeks postpartum.

  Very High Risk – Women with recurrent VTE associated with antithrombin defiency or the antiphospholipid syndrome. These women require thromboprophylaxis with the **higher prophylactic dose** of LMWH (12 hourly) or weight adjusted (75% of treatment dose) antenatally on the instructions of the Consultant Haematologist and for 6 weeks postpartum or until converted back to warfarin. Specialist management by haematologist should be sought with appropriate follow up plan.

2.5.2 Thrombophilia

- Heritable thrombophilia is found in 20-50% of women with pregnancy related VTE (Lim W, Eikelboom JW, Ginsberg JS. 2007). Women should be stratified according to level of risk associated with their thrombophilia and presence or absence of a family history or other risk factors.

- All women with thrombophilia, even if asymptomatic, should have LMWH for 7 days postnatally. This should be extended to 6 weeks in the presence of any other persistent risk factors.

- Women with antithrombin deficiency, factor V Leiden homozygous, those with more than one thrombophilic defect or those with additional risk factors should have antenatal prophylaxis continuing for 6 weeks postpartum.

In antithrombin deficiency, higher doses of LMWH (weight adjusted: 75% or 100% of treatment dose) (Bates. SM, et al 2008), may be necessary as judged by anti-Xa levels and monitoring should be by haematologist with expertise in haemostasis.

2.5.2.1 Antiphospholipid syndrome

Women with antiphospholipid syndrome i.e. a clinical event (thrombosis or pregnancy loss after 10 weeks gestation) AND positivity of lupus anticoagulant and/or anticardiolipin antibodies) should be offered both antenatal and 6 weeks of postpartum thromboprophylaxis.

2.5.2.2 Factor V Leiden

- An inherited autosomal dominant hypercoagulability disorder in which Factor V, one of the coagulation factors, cannot be deactivated (sometimes known as activated protein C resistance).

- The risk of VTE depends on whether an affected person has inherited one or two copies of the affected mutation. Inheriting one copy (heterozygous) increases the risk of a clot 4- to 8-fold. Inheriting two copies (homozygous) increases the risk of clotting by up to 80-fold.

- Women who are heterozygous for factor V Leiden may not need antenatal or postnatal thromboprophylaxis in the absence of any other risk factors. However, women who are homozygous will require antenatal thromboprophylaxis plus 6 weeks of postnatal thromboprophylaxis.

2.6 Patient Information

All women must receive verbal and written information (see Appendix for information leaflet) relating to VTE on admission and discharge. This must then be documented on the VTE Risk Assessment Proforma.

2.7 Graduated elastic compression stockings

The use of properly applied graduated compression stockings of appropriate strength is recommended in pregnancy and the puerperium for:

- Those who are at risk of VTE, 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, presence of more than three risk factors)
- Outpatients with prior VTE (usually combined with LMWH)
- Women travelling long distance for more than 4 hours.

2.8 Flowtron boots

- They should be used in the case of any women deemed to have risk factors for VTE in whom LMWH is contra-indicated (see below).

2.9 Contraindications to LMWH

- Women with active antenatal or postpartum bleeding
- 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) severe liver disease (prothrombin time above normal range or known varices.

- 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.

2.10 Suggested thromboprophylactic doses for antenatal and postnatal LMWH[4]

Weight	Enoxaparin (clexane)	Dalteparin	Tinzaparin
<50kg	20mg once daily	2,500units daily	3500units daily
50-90kg	40mg once daily	5000units daily	4500units daily
91-130kg	60mg once daily	7500 units daily	7000units daily
131-170kg	80mg once daily	10000units daily	9000 units daily
>170kg	0.6mg/kg/day once daily	5000 units 12 hourly	4500 units 12 hourly

3. OTHER DOCUMENTS TO BE CONSIDERED IN CONJUNCTION WITH THIS GUIDELINE:

i. Caesarean Section

ii. High Dependency Care

iii. Operative Vaginal Delivery

iv. Obesity

v. Maternal Collapse

vi. Diagnosis and Management of Venous Thromboembolism/PE in pregnancy and the puerperium

vii. MCHT - Venous Thromboembolism Policy

4. CONSULTATION WITH STAKEHOLDERS DURING THE DEVELOPMENT OF THIS GUIDELINE

This guideline has been developed in consultation with:

- Divisional Clinical Director
- Consultant Obstetrician Clinical Lead for Obstetrics and Gynaecology
- Consultant Obstetrician Lead Obstetrician for Risk Management and Labour Ward
- Consultant Obstetrician Lead Obstetrician for Audit
- Clinical Governance Lead, Risk Manager and CNST Lead for Women's Health
- Supervisor of Midwives
- Head of Midwifery
- Obstetric, Gynaecology & Sexual Health Governance Committee

5. MONITORING AND REVIEW

5.1 Process for monitoring compliance with all of the above requirements, review of results and subsequent monitoring of action plans

Adverse incidents relating to the management of the **Thromboprophylaxis during Pregnancy, Labour and the Puerperium Guideline** should be reported via the Trust Incident Reporting System, such incidents will be investigated and managed in accordance Trust Policy *'Integrated Governance & Risk Management Strategy 2010 – 2013'* March 2011

The requirement to audit this guideline will be included in the Divisional Clinical Audit programme in liaison with the Divisional Clinical Audit Lead which will be approved by the Obstetric, Gynaecology and Sexual Health Governance meeting. The Trust Standard Action Plan will be used by the identified lead with identified timescales. Any required changes to practice will be identified and actioned within the specified timeframe by an identified lead member of the team to take each change forward where appropriate. The Action Plan is submitted to the named committee responsible for that area and the actions and timescales will be monitored by the named committee. If a timescale breaches the specified deadline, this is escalated upwards to the reporting committee. The identified lead is responsible for ensuring that all actions are completed within the timescales agreed in conjunction with the person responsible for the action. Lessons learnt will be shared with all relevant parties.

Monitoring compliance and audit requirements for this guideline, as a minimum will include:

Standard/Process/Issue	Monitoring and Audit			
	Method	By	Committee	Frequency
Appropriate and timely risk assessments to identify those at risk of VTE	Ongoing monitoring of 1% of health records per year of women who have delivered following thromboprophylaxis during the antenatal and/or postnatal period using the MCHT Maternity Monitoring Tool	CNST team	O and G Governance	Quarterly
Actions to be taken in response to the risk assessments once the risk of VTE has been identified	Ongoing monitoring of 1% of health records per year of women who have delivered following thromboprophylaxis during the antenatal and/or postnatal period using the MCHT Maternity Monitoring Tool	CNST team	O and G Governance	Quarterly
Documentation of an individual management plan in the health records of women who require thromboprophylaxis or treatment for a diagnosis of VTE	Ongoing monitoring of 1% of health records per year of women who have delivered following thromboprophylaxis during the antenatal and/or postnatal period using the MCHT Maternity Monitoring Tool	CNST team	O and G Governance	Quarterly
Annual Monitoring report	Annual report collating all monitoring data collected regarding thromboprophylaxis	CNST team	Clinical Audit Meeting	Annually

Standard/Process/Issue	Monitoring and Audit			
	Method	By	Committee	Frequency
Audit of the processes described in the guideline on a rolling basis - processes to be audited will be selected based on any previous 'hotspots' or recent clinical incidents	Audit of a minimum of 1% of healthcare records of all women who have delivered to ensure appropriate risk assessments are being completed. Audit of 1% of healthcare records of all women in whom the risk assessment has been completed to assess response any identified risks.	Clinician nominated by clinical audit lead as part of departmental rolling audit programme	Clinical Audit Programme	3 yearly

5.2 Review

This guideline will undergo review at least on a 3 yearly basis or earlier if new guidance is published.

6. REFERENCES

Bates SM, Greer IA, Pabinger I, Sofaer S, Hirsh J. Venous thromboembolism, thrombophilia, antithrombotic therapy and pregnancy: American College of Chest Physicians evidence based clinical practise guidelines(8th edition) Chest 2008;(6 suppl):844s-6s.

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Appendix 1- Antenatal dosage of LMWH

ANTENATAL RISK ASSESSMENT FOR THROMBOPROPHYLAXIS		
LOW RISK	• Score 0,1,2 on risk assessment tool	Reassess if clinical condition changes
INTERMEDIATE RISK	• Score 3 or more risk assessment tool • Previous DVT • BMI > 40 plus 1 other risk factor • Antiphospholipid syndrome • Antithrombin deficiency • >1 inherited thrombophilia • Homozygous for an inherited thrombophilia	Prophylactic dose of LMWH *higher prophylactic dose of LMWH may be required in certain cases if instructed by haematologist*
HIGH RISK	• Confirmed current VTE • Suspected current VTE (awaiting investigation)	Treatment dose of LMWH

Prophylaxis	Enoxaparin (Clexane)100units/mg
Booking weight < 50kg	20 mg once daily
Booking weight 50-90kg	40 mg once daily
Booking weight 91-130kg	60 mg once daily
Booking weight 131-170kg	80 mg once daily
Booking weight >170kg	0.6mg/kg/day once daily
Therapeutic dose	1 mg/kg 12 hourly

Appendix 2- Postnatal dosage of LMWH

POSTNATAL RISK ASSESSMENT FOR THROMBOPROPHYLAXIS		
LOW RISK	• Score 0,1 on risk assessment tool	Reassess if clinical condition changes
INTERMEDIATE RISK 1	• Score 2 or more risk assessment tool • All Emergency Caesarean sections • Single asymptomatic thrombophilia • BMI > 40	Prophylactic dose of LMWH for 7 days
INTERMEDIATE RISK 2	• Previous VTE • 3 current/persisting risk factors • Antithrombin deficiency • >1 inherited thrombophilia • Homozygous for an inherited thrombophilia	Prophylactic dose of LMWH for 6 weeks
HIGH RISK	• Confirmed current VTE • Suspected current VTE (awaiting investigation)	Treatment dose of LMWH

Prophylaxis	Enoxaparin (Clexane) 100units/mg
Booking weight < 50kg	20 mg once daily
Booking weight 50-90kg	40 mg once daily
Booking weight 91-130kg	60 mg once daily
Booking weight 131-170kg	80 mg once daily
Body weight >170kg	0.6mg/kg/day once daily
Therapeutic dose	1.5 mg/kg daily

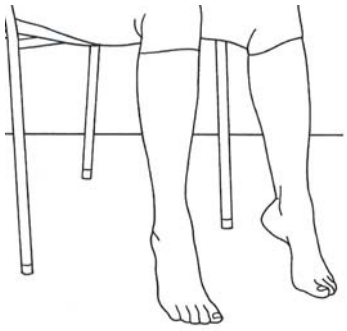
Preventing Deep Vein Thrombosis (DVT)

Deep Vein Thrombosis is caused by a blood clot forming inside a blood vessel. If this happens in a deep vein, usually in your leg, it is called a Deep Vein Thrombosis (DVT). You may be at risk, due to prolonged sitting whilst attending for treatment.

The following anti-DVT exercises may help reduce the risk of DVT:

With your heels on the floor:

1. Raise your toes up; then lower your toes to the floor
2. Then raise your heels up, keeping your toes on the floor to simulate a (rocking motion)



Do this briskly for 30 seconds at least every half an hour (you can do it more often if you like)

- Walk around whenever you can
- Drink plenty of water

For further tips on how to prevent a DVT visit NHS Choices website
www.nhs.uk

This information is available in audio, Braille and other languages. To request a copy please telephone 01270 273104.

Printed July 2011 Review July 2012: Ref:SC/DVT/0010711