# VENOUS THROMBOEMBOLISM MATERNITY GUIDELINES

<table>
<thead>
<tr>
<th>Version:</th>
<th>3.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratified by:</td>
<td>Maternity Quality Board</td>
</tr>
<tr>
<td>Date ratified:</td>
<td>17th January 2013</td>
</tr>
<tr>
<td>Approving Committee/Group (Date)</td>
<td>Thrombosis Committee (3/8/12)</td>
</tr>
</tbody>
</table>
| Date Approved by Medicines Management Committee: | 10th July 2012  
14th August 2012 – Chair’s actions |
| Name and Title of originator/author: | Bini Ajay, Consultant obstetrician and Gynaecologist |
| Date issued:      | January 2013 |
| Review due date:  | January 2016 |
| Target audience:  | All maternity staff |
| Superseded documents | Maternity Guidelines – Venous Thromboembolism 2009  
Labour Ward Guideline – Anticoagulant Therapy October 2008  
Labour Ward Guideline – Thromboprophylaxis |
| Relevant Standards(e.g. NHSLA, CQC, HSE) | NHSLA CNST Maternity Standards 3:8 |
| Acknowledgements | None |
| Key Words | Venous Thromboprophylaxis, anticoagulant, |
CONTENTS

1 INTRODUCTION 4
2 PURPOSE AND SCOPE 4
3 DEFINITIONS 4
4 ACCOUNTABILITIES AND RESPONSIBILITIES 4
5 RISK ASSESSMENT AND THROMBOPROPHYLAXIS DURING PREGNANCY 5
  5.1 Antenatal Risk Assessment 5
6 ANTENATAL THROMBOPROPHYLAXIS 6
7 RECOMMENDATIONS FOR WOMEN WITH PREVIOUS VTE 6
  7.1 Very High Risk 6
  7.2 High Risk 6
  7.3 Intermediate Risk 7
8 TESTING FOR THROMBOPHILLIA IN PREGNANCY 7
9 RECOMMENDATIONS FOR WOMEN WITH THROMBOPHILLIA 7
  9.1 Inherited Thrombophilia 7
  9.2 Acquired Thrombophilia (antiphospholipid syndrome) 8
10 DELIVERY PLANNING AND USE OF REGIONAL ANAESTHETIC FOR WOMEN ON LMWH DURING PREGNANCY 8
11 THROMBOPROPHYLAXIS AFTER DELIVERY 9
  11.1 Risk Assessment 9
  11.2 Women at risk of bleeding 10
  11.3 Raised BMI 10
  11.4 Previous DVT 10
  11.5 Thrombophilia 10
  11.6 Caesarean section 10
12 AGENTS USED FOR ANTENATAL THROMBOPROPHYLAXIS 11
  12.1 Low Molecular weight Heparin 11
  12.2 Unfractionated Heparin 11
  12.3 Low dose Aspirin 12
  12.4 Warfarin 12
  12.5 Graduated Elastic Compression Stockings 12
13 AGENTS FOR POSTPARTUM THROMBOPROPHYLAXIS 12
14 CONTRAINDICATIONS TO LMWH 13
15 ACUTE MANAGEMENT OF THROMBOEMBOLIC DISEASE IN PREGNANCY AND PUERPERIUM 13
  15.1 Diagnosis of Acute VTE 13
    15.1.1 Clinical Features of DVT 13
    15.1.2 Investigations for DVT 13
  15.2 Clinical features of Pulmonary Embolism 14
    15.2.1 Investigations for Acute PE 14
    15.2.2 Risk of V/Q and CTPA 14
    15.2.3 Base line blood tests 15
  15.3 Treatment of VTE in Pregnancy 15
    15.3.1 Monitoring of Women on LMWH 15
  15.4 Massive PE 16
15.4.1 Regimen for administration of unfractionated heparin
16
15.4.2 Infusion rates according to APTT
16
15.5 Additional Treatments for VTE
16
15.6 Maintenance Treatment of VTE
17

16 TREATMENT OF VTE DURING LABOUR AND DELIVERY
17

17 POSTNATAL ANTICOAGULATION
18

18 PREVENTION OF POST THROMBOTIC SYNDROME
18

19 POSTNATAL FOLLOW UP
19

20 TRAINING
19
   6.1 Equality Impact Assessment
19

21 MONITORING COMPLIANCE
20

22 REFERENCES
21

23 ASSOCIATED DOCUMENTATION
21

24 VERSION HISTORY TABLE
21

APPENDIX A – EQUALITY IMPACT ASSESSMENT
23

APPENDIX B – CONSULTATION TEMPLATE
24

APPENDIX C – ANTENATAL RISK ASSESSMENT AND MANAGEMENT
25

APPENDIX D – POSTNATAL RISK ASSESSMENT AND MANAGEMENT
26

APPENDIX E - POSTNATAL WARFARIN THERAPY PROTOCOL
27
1 INTRODUCTION

Pulmonary embolism is the leading cause of maternal deaths in UK. In the last confidential enquiry into maternal deaths and child health (CEMACH) there was 41 deaths from thromboembolism and 27 of these women had risk factors. It is estimated that the mortality and morbidity associated with venous thromboembolism (VTE) in obstetric patients can be reduced by up to two thirds.

Many antenatal VTE events occur in the first trimester and prophylaxis therefore if required should commence as soon in pregnancy as possible. The highest risk for VTE is in the post partum period.

A raised body mass index (BMI) and delivery by caesarean section are independent significant risk factors for VTE. Women who have vaginal delivery are also at risk. Women who deliver by elective caesarean section have at least double the risk of VTE compared to women who have a vaginal delivery. Women who are delivered by emergency caesarean section have an almost 4 fold increased risk of VTE compared to women who have elective caesarean section.

2 PURPOSE AND SCOPE

The aim of this guideline is to provide advice for prevention of VTE during pregnancy and following delivery and to ensure that all women are formally assessed with appropriate measure taken to reduce the risk of developing a venous thromboembolism.

3 DEFINITIONS

- Venous thrombosis occurs when a blood clot (thrombus) forms in a vein. Because blood flow through the vein is limited swelling and pain can develop. Venous thrombosis most commonly occurs in the deep veins in the legs, thighs, or pelvis.
- An embolus occurs if part or all of the blood clot breaks off and travels though the venous system. If the clot lodges in the lung then a pulmonary embolism (PE) is created.
- Thromboprophylaxis is the treatment given to prevent clots forming in the veins.

4 ACCOUNTABILITIES AND RESPONSIBILITIES

- This policy applies to all staff with clinical responsibility for VTE risk assessment, prevention and treatment.
- The Clinical Director is responsible for ensuring implementation and compliance within the Directorate.
- It is the responsibility of all clinicians to be knowledgeable of and appreciate the significance of signs and symptoms in the light of known risk factors.
- Midwives and Obstetricians are responsible for undertaking a risk assessment at the appropriate time and acting on identified risk factors.
- It is the responsibility of obstetrician and anesthetists to initiate treatment promptly when indicated by the risk assessment.

Chief Executive
Has ultimate responsibility for the implementation and monitoring of the policies in use in the Trust
Clinical Leads/Director of Midwifery
Have responsibility to ensure that the requirements of this guideline are followed and that this is audited and monitored through the Maternity Quality Board

Clinical Midwifery Managers/Practice Development Midwives.
Have responsibility for ensuring that staff are aware of the requirements of this guideline and that they disseminate any changes in practice and amendments to this guideline to relevant staff groups

Practice Review and Guidelines Group
The group are responsible for the consultation and approval process required during the development of guidelines for the Maternity Unit.

The Maternity Quality Board
The Maternity Quality Board is responsible for the ratification of guideline prior to implementation. This ratification process will take place following the consultation and approval process.

All Staff
It is incumbent on relevant staff when asked, to provide comments and feedback on the content and practicality of the guideline.

5 RISK ASSESSMENT AND THROMBOPROPHYLAXIS DURING PREGNANCY

5.1 Antenatal Risk Assessment

An individual assessment of thrombotic risk must occur in early pregnancy at booking, at whatever gestation the booking occurs wherever the booking occurs. This should be clearly documented on the risk assessment proforma - see Appendix C, page 19, with a plan for prophylaxis during pregnancy, labour and in postpartum period within the maternity hand held record. Further risk assessments must be carried out every time women are admitted antenatally, in the immediate period after delivery and if the in-patient episode lasts longer than three days. Please see Table 1 for risk factors. Following identification of risk factors the woman identified as at either intermediate or high risk must be referred to a Consultant Obstetrician clinic or an Obstetric registrar if an inpatient. A individual management plan of care must be documented in the woman’s healthcare records

Women at high risk of VTE should receive counselling in the pre-conception period and a plan of care should be made. Women who become pregnant before receiving such prospective management should be referred to Consultant Obstetrician immediately.

Table 1 Risk Factors for Venous thromboembolism in pregnancy

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Existing</td>
<td>Previous Venous Thromboembolism</td>
</tr>
<tr>
<td></td>
<td>Thrombophilia;</td>
</tr>
<tr>
<td></td>
<td><em>Heritable</em>: Antithrombin Deficiency</td>
</tr>
<tr>
<td></td>
<td>Protein C deficiency</td>
</tr>
<tr>
<td></td>
<td>Protein S deficiency</td>
</tr>
<tr>
<td></td>
<td>Factor V Leiden</td>
</tr>
<tr>
<td></td>
<td>Prothrombin Gene Variant G20210A</td>
</tr>
<tr>
<td></td>
<td><em>Acquired</em>: Antiphospholipid Syndrome</td>
</tr>
<tr>
<td></td>
<td>Persistent Lupus Anticoagulant</td>
</tr>
<tr>
<td></td>
<td>Persistent moderate /high titre anticardiolipin antibodies</td>
</tr>
<tr>
<td></td>
<td>Persistent beta 2 glycoprotein 1 antibodies</td>
</tr>
<tr>
<td></td>
<td>Age over 35 years</td>
</tr>
<tr>
<td></td>
<td>Obesity (BMI &gt;30kg/m2)</td>
</tr>
<tr>
<td></td>
<td>Parity &gt;3</td>
</tr>
<tr>
<td></td>
<td>Smoking</td>
</tr>
<tr>
<td></td>
<td>Gross Varicose Veins</td>
</tr>
<tr>
<td>Post-Existing</td>
<td></td>
</tr>
<tr>
<td>Postpartum</td>
<td></td>
</tr>
<tr>
<td>Post-discharge</td>
<td></td>
</tr>
</tbody>
</table>
### 6 ANTEMNATAL THROMBOPROPHYLAXIS

Any women with 3 or more current risk factors other than Previous VTE or thrombophilia should be given antenatal prophylactic low molecular weight heparin (LMWH) and this should continue for 6 weeks post partum.

Following are recommendations for specific situations.

### 7 RECOMMENDATIONS FOR WOMEN WITH PREVIOUS VTE

Women with a history of previous VTE can be divided into the following groups for the purpose of risk assessment and thromboprophylaxis in antenatal and postpartum period.

#### 7.1 Very High Risk

Women with history of recurrent VTE in past with either antithrombin deficiency or antiphospholipid syndrome constitute this group. The majority of these women will be on long term warfarin.

Women should be counselled about the risk of warfarin to their baby and advised to stop warfarin, changed to LMWH as soon as pregnancy is confirmed.

Women who are not on warfarin should be counselled about the increased risk of VTE in pregnancy and prophylaxis with LMWH in the antenatal period should be recommended.

Higher doses of LMWH (either high prophylactic (12 hourly) or weight adjusted dose (75% of treatment dose is required). This group of women must be referred to the Haematologist.

#### 7.2 High Risk

This group includes women who had single previous VTE that was unprovoked, idiopathic or oestrogen related (pregnancy or contraceptive pill) or who have other risk factors such as family
7.3 Intermediate Risk

This group includes women who have had a previous VTE which was provoked by a transient major risk factor which is no longer present where they do not have any other risk factors. These women do not require antenatal thromboprophylaxis with LMWH in the antenatal period but should be monitored closely for development of any other risk factors. LMWH should be given for six weeks postnatal for this group of women.

8 TESTING FOR THROMBOPHILLIA IN PREGNANCY

Pregnancy affects the results of thrombophilia tests in particular protein S, levels of which are reduced in pregnancy. The test should only be carried out if it will alter the proposed management of pregnancy. Women should be counselled before testing about implications of the results for themselves and their family members.

The two main groups of women where testing for thrombophilia will contribute to clinical decision making are:

1. In women with previous non-oestrogen related VTE associated with temporary/minor risk factor (such as long distance travel), testing for thrombophilia may affect the decision whether or not antenatal LMWH is required.

2. In women with previous deep vein thrombosis (DVT), if antiphospholipid syndrome or antithrombin deficiency is detected, this will influence the dose of thromboprophylaxis in pregnancy.

If indicated, testing for thrombophilia should be carried out in early pregnancy.

9 RECOMMENDATIONS FOR WOMEN WITH THROMBOPHILLIA

These women should be categorized according to the level of risk associated with thrombophilia and the presence of any other risk factors or family history. If LMWH is given in antenatal period for prophylaxis, it should be continued for six weeks post partum.

9.1 Inherited Thrombophilia

Women with heritable thrombophilia (such as women with Heterozygous factor V Leiden, Prothrombin G20210, Protein C and Protein S deficiency) who are asymptomatic and do not have any other additional risk factors (such as increasing age, obesity, personal or family history of VTE) can be managed conservatively in the antenatal period but should be monitored for development of any additional risks during pregnancy and in postnatal period. These women should be given LMWH for 7 days postnatally in the absence of any additional risk factors. Exception are Women with antithrombin deficiency or more than one thrombophilic defects (including homozygous factor V Leiden, Homozygous Prothrombin G20210A and compound Heterozygotes) or those with additional risk factors antenatal thromboprophylaxis is recommended. Referral to Haematologist by the Obstetrician should be considered for these women.

For women with antithrombin deficiency who are asymptomatic an intermediate dose of heparin may be required. It must be recognized that heparin may not be as effective in these women as their mode of action is antithrombin dependent. Monitoring of anti-Xa levels is therefore required in such cases. Different sub-types of antithrombin deficiency are associated with
different levels of risk of VTE and these women should be referred to the Haematologist. Thromboprophylaxis should be started in pregnancy as soon as possible in these women and should continue for six weeks post partum.

9.2 Acquired Thrombophilia (antiphospholipid syndrome)

Antiphospholipid syndrome is defined as presence of a lupus anticoagulant and/or anticardiolipin and/or beta 2 glycoprotein 1 antibodies of medium to high titre on two occasions 12 weeks apart, (which suggests they are persistently positive) in association with history of thrombosis OR adverse pregnancy outcome (3 or more unexplained miscarriages before 10 weeks or fetal death after 10 weeks or a premature delivery before 35 weeks due to severe pre-eclampsia or intra uterine growth restriction (IUGR).

Women with asymptomatic inherited or acquired thrombophilia without any other risk factors should be managed conservatively in the antenatal period but should be given LMWH for 7 days postpartum. This period should be extended to 6 weeks if there is a family history or other risk factors.

Women with previous VTE and antiphospholipid syndrome require antenatal and postnatal prophylaxis (for six weeks) with LMWH. Women with persistent antiphospholipid antibodies with no previous history of VTE and any other risk factors or fetal indications for LMWH can be managed conservatively in antenatal period but LMWH prophylaxis is required for postnatal period for 7 days.

When should antenatal thromboprophylaxis start?

If indicated, thromboprophylaxis should start as soon as possible in pregnancy.

If thromboprophylaxis is indicated on the basis of either the booking risk assessment or any subsequent risk assessment the woman should be referred to a Consultant Obstetrician for an appointment within the next few days if in the community.

If the risk assessment is undertaken during an antenatal attendance to the maternity unit Triage or while an antenatal inpatient the woman must be referred immediately to an obstetrician

The obstetrician will prescribe LMWH. Any woman prescribed LMWH will continue under obstetric led care and attend the antenatal clinic for on-going monitoring of dosage.

10 DELIVERY PLANNING AND USE OF REGIONAL ANAESTHETIC FOR WOMEN ON LMWH DURING PREGNANCY

- Women who are on LMWH during pregnancy, a written plan by the consultant Obstetrician and/or Haematologist (where required) should be in place for thromboprophylaxis in the period around delivery.

- Women on LMWH during pregnancy should be referred to the Anaesthetist as early as possible to discuss use of regional anaesthesia/analgesia at the time of delivery with a clear plan written in the medical records.

- Women should be advised to stop injecting any further LMWH if they start vaginal bleeding, contractions or rupture their membranes. They should be assessed in hospital and further doses should be prescribed by medical team.

- Regional Anaesthetic techniques should not be used at least 12 hours after last prophylactic dose of LMWH.
Regional Anaesthetic techniques should not be used for at least 24 hours after last therapeutic dose of LMWH.

LMWH should not be given for at least 4 hours after use of spinal anaesthetic or after removal of epidural catheter.

Epidural catheter should not be removed within 10-12 hours of most recent injection.

For women planned to have an elective caesarean section the last dose of LMWH should be given in the evening the day before delivery and any morning dose on the day of delivery should be omitted. The caesarean should be performed in the morning and a prophylactic dose should be given 4 hours after spinal anaesthetic or after removal of epidural catheter.

Antenatal LMWH should be prescribed in the evening where possible as it allows for elective caesarean section in the morning, removal of epidural catheter before 2pm and first postnatal dose can be started at 6 pm on same day.

Induction of labour can be considered particularly for women who are taking high prophylactic or therapeutic dose of LMWH in order to help plan thromboprophylaxis around delivery. These women are expected to be on twice daily LMWH. The evening dose should be omitted on the day before induction in multiparous women.

For women taking high prophylactic or therapeutic dose of LMWH the dose of heparin should be reduced to a prophylactic dose on the day before induction of labour and if appropriate this should be continued during labour.

Women who present in labour within 12 hours of last dose of LMWH, regional anaesthetic techniques should not be used and alternative analgesia should be offered. The on call obstetric and anaesthetic should be informed of the admission of such women.

11 THROMBOPROPHYLAXIS AFTER DELIVERY

11.1 Risk Assessment

The Midwife/Obstetrician should assess the risk in the immediate period after delivery by completing the risk assessment proforma – see Appendix D and plan prophylaxis according to estimated risk. Following identification of risk factors the woman identified as at either intermediate or high risk must be referred to an Obstetric registrar by the Midwife responsible for the womans care and a plan of care documented in the womans healthcare records. When carrying out the postnatal VTE risk assessment the woman parity must include the delivery e.g. a woman having delivered her second child is now a para 2; a woman having delivered her third baby is now a para 3. Example:

36 year old Woman gives birth normally to her third child

Following delivery:
Gravida 3
PARA 3

Postnatal VTE Risk Assessment
Two risk factors identified:
Parity ≥ 3
Maternal age >35

Two or more risk factors the woman should receive PROPHYLACTIC LMWH for at least 7 days
Women with 2 or more current or persistent risk factors other than thrombophilia and previous DVT (such as prolonged labour, infection, blood transfusion- see Table 1 Risk Factors for Venous thromboembolism in pregnancy) should receive prophylactic LMWH for 7 days. If women have persistent risk factors (prolonged hospital admission, wound infection) lasting for more than 7 days, Thromboprophylaxis should be extended for up to 6 weeks post-delivery.

Dosage is calculated according to the woman's weight at the booking appointment. The weight must be accurately recorded in kilograms (kg) on the inpatient medication chart.

Information regarding the dose, indication and duration of treatment must be communicated at transfer of care of the woman to the community on the discharge summary

11.2 Women at risk of bleeding

Immediately post delivery, women who are at high risk of bleeding such as progressive wound haematoma, coagulopathy, suspected intra abdominal bleeding should be reviewed by senior obstetrician before starting LMWH. In this group of women unfractionated Heparin or graduated compression stockings can be used initially until it is certain that patient is not at increased risk of haemorrhage.

It should be remembered that excess blood loss and blood transfusion are risk factor for VTE and Thromboprophylaxis should be re started as soon as risk of haemorrhage is reduced.

11.3 Raised BMI

All Women with BMI > 30 should be encouraged to mobilize as early as possible after delivery.

**All women with class 3 obesity (BMI>40) should receive LMWH for 7 days post delivery regardless of the mode of delivery.** If there is an additional risk factor such as wound infection that persists for longer than 7 days, prophylactic LMWH should be continued for 6 weeks. See Obesity in pregnancy guidelines

11.4 Previous DVT

All women with history of previous DVT require prophylactic LMWH or warfarin for 6 weeks postpartum regardless of the mode of delivery.

11.5 Thrombophilia

Women with Inherited or acquired Thrombophilia should receive LMWH prophylaxis for at least 7 days post partum regardless of mode of delivery and even if they did not receive antenatal thromboprophylaxis. This should be extended to 6 weeks if there is family history of VTE or additional risks are present.

11.6 Caesarean section

All women who had delivery by emergency caesarean section (Category1-3) should receive prophylactic LMWH for 7 days.

All women who had planned (category 4) caesarean section who have one or more additional risk factors (such as age >35, BMI > 30, excess blood loss, blood transfusion- see table) should receive thromboprophylaxis with LMWH for 7 days.

The LMWH is prescribed by the Anaesthetist present at the caesarean section. The obstetrician team will ensure that TTA’s are prescribed prior to the woman's discharge home.
The ward midwife will demonstrate how the LMWH is given and ensure that either the woman is able to self-administer the LMWH or alternative a family member.

12 AGENTS USED FOR ANTENATAL THROMBOPROPHYLAXIS

12.1 Low Molecular weight Heparin

The agent of choice in antenatal period is LMWH as it is as effective as unfractionated heparin and is safer. Please see the prophylactic and therapeutic dose of Dalteparin below. This is the drug of choice at Croydon University Hospital for in antenatal and postnatal period.

Dose based on early pregnancy bodyweight and should not change.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Dalteparin</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50</td>
<td>2500 units daily</td>
</tr>
<tr>
<td>50-90</td>
<td>5000 units daily</td>
</tr>
<tr>
<td>91-130</td>
<td>7500 units daily*</td>
</tr>
<tr>
<td>131-170</td>
<td>10000 units daily*</td>
</tr>
<tr>
<td>&gt;170</td>
<td>75 units /kg/day*</td>
</tr>
<tr>
<td>High Prophylactic Does (intermediate) doses for women weighing 50-90 kg</td>
<td>5000 units 12-hourly</td>
</tr>
</tbody>
</table>

* May be given in 2 divided doses
Dosing schedule from RCOG, Green Top Guideline No 37a

**Monitoring of Women on LMWHs**
Baseline FBC, coagulation screen, U&E, LFT, accurate body weight.
Repeat FBC within 24 hours if previous exposure to heparin.
Repeat FBC once between days 5 & 7 and once between days 10 & 14 to detect HIT.
Weekly potassium levels in patients at high risk of hyperkalaemia.

**Monitoring of anti Xa levels is not required when LMWH is used for prophylaxis provided that renal function of the patient is normal.** Lower doses of Dalteparin should be administered if creatinine clearance is less than 30mls/min (this is equivalent to creatinine level of 200micromol/min for a 30 year old woman.

Before starting any women on long term prophylactic or therapeutic LMWH, renal function should be checked and advice from Haematologist sought if serum creatinine is raised.

12.2 Unfractionated Heparin

Unfractionated heparin is occasionally required for thromboprophylaxis around the time of delivery for women who are at high risk of thrombosis (where women are at high risk of bleeding, or there is reluctance to use LMWH in case regional anaesthetic is required). The advantage for using this is that it has short half life and there is more complete reversal of its activity by protamine sulphate.
Use of Unfractionated heparin has associated risk of thrombocytopenia and platelet count therefore should be monitored due to limited experience of its use in pregnant women.

12.3 Low dose Aspirin

Aspirin is safe in pregnancy and breast feeding. There is lack of robust evidence for its use during pregnancy or postnatal period for prevention of VTE. Its use is however appropriate in women with Antiphospholipid syndrome to improve fetal outcomes.

12.4 Warfarin

Warfarin crosses the placenta and its use in the antenatal period is associated with increased risk of congenital abnormalities.

(Characteristic warfarin embryopathy occurs in about 5% of fetuses exposed between 6-12 weeks gestation). The risk is higher in women taking dose greater than 5 mgs/day. Its use in pregnancy is also associated with increased risk of miscarriage, still birth, neurological problems in baby and fetal and maternal haemorrhage.

Warfarin can be used in selected cases in the antenatal period after consultation with Haematologist such as women with Mechanical Heart valves.

*Use of Warfarin is safe in breast feeding.*

12.5 Graduated Elastic Compression Stockings

*All women with previous DVT or a thrombophilia should wear Graduated Compression stockings through out Pregnancy and for 6-12 weeks after Delivery.*

Use of properly applied graduated compression stockings is recommended in pregnancy and puerperium for following women:

- Those who have a contraindication to the use of LMWH and are an inpatient
- Women who are post caesarean section (in combination with LMWH) and are considered to be at high risk of VTE (such as previous DVT, more than 3 risk factors.)
- Women travelling long distances for longer than 4 hours.
- Women who are not inpatient but have history of previous DVT, stockings should be used in combination with LMWH.

13 AGENTS FOR POSTPARTUM THROMBOPROPHYLAXIS

- Both Heparin and Warfarin are safe in breastfeeding.
- LMWH can be started in immediate postpartum period. For women who are on long term anticoagulation with Warfarin, it can be re started once risk of haemorrhage is considered to be low (usually 5-7 days after delivery).
- Warfarin should be used for women who require prophylaxis for longer than seven days postpartum. Use of Warfarin is associated with increased risk of postpartum haemorrhage and perineal haematoma compared with use of LMWH. Conversion of LMWH to Warfarin should be delayed for 5-7 days after delivery to reduce the risk of haemorrhage during the overlap period.
Women who are on warfarin during pregnancy, it can be maintained in the postnatal period too.

Fondaparinux should be avoided in breastfeeding.

14 CONTRAINDICATIONS TO LMWH

A careful assessment should be made by the Obstetrician in the period immediately after delivery. Women who are at high risk of bleeding LMWH should be avoided or delayed depending on the clinical situation.

Following are the contraindications to the use of LMWH

- Women with active bleeding (antenatal or postnatal)
- Women considered at increased risk of haemorrhage e.g. women with placenta preavia.
- Women who have known bleeding disorder such as von Willibrands’s disease, Haemophilia and acquired coagulopathy.
- Women with thrombocytopenia – platelets less than 75.
- Acute stroke in last 4 weeks
- Severe renal disease
- Severe liver dysfunction
- Uncontrolled Hypertension

15 ACUTE MANAGEMENT OF THROMBOEMBOLIC DISEASE IN PREGNANCY AND PUERPERIUM

15.1 Diagnosis of Acute VTE

15.1.1 Clinical Features of DVT

Classical features are redness, swelling, pain and calf tenderness. These features are however unreliable in pregnancy and clinical assessment alone will be wrong in 30-50% of cases.

Right sided DVT is more common in pregnant women compared to non pregnant population.

Iliofemoral thrombosis is more common than popliteopfemoral. (72% in pregnant vs 9% in non pregnant patients).

Leg odema is more common in pregnancy without DVT and often may be asymmetrical.

Women with iliac vein thrombosis can present with swelling of entire limb and back pain.

15.1.2 Investigations for DVT

Doppler ultrasound should be performed in all pregnant women suspected of having DVT. Treatment with LMWH should be commenced as soon as diagnosis is suspected clinically and this should be continued until objective testing excludes the diagnosis unless treatment is strongly contraindicated.
Doppler ultrasound is accurate in detecting the thrombi above calf and below inguinal ligament. Clots confined to calf do not usually embolize and give rise to emboli. If Doppler ultrasound is negative but clinical suspicion of DVT is high, treatment should be continued and Doppler ultrasound should be repeated in one week.

If iliac vein thrombosis is suspected, this should be discussed with the radiologist for further imaging. Magnetic resonance venography or conventional contrast venography may be considered in such cases.

### 15.2 Clinical features of Pulmonary Embolism

Patients may present with chest pain, shortness of breath, cough and haemoptysis. Women who have a large PE may present with collapse, shock and central chest pain.

Clinical examination may show tachypnoea, tachycardia, raised JVP, loud second heart sound and right ventricular heave. If there is associated pulmonary infarction, a pleural rub and fever may be present.

High index of suspicion is needed for diagnosis. All pregnant women presenting with shortness of breath and pleuritic chest pain should be investigated for PE.

#### 15.2.1 Investigations for Acute PE

In pregnant women with suspected PE initial investigations should include X-ray chest and bilateral leg Doppler. A diagnosis of DVT may indirectly confirm diagnosis of PE and further investigations may not be required as anticoagulant therapy for both is the same. This will also limit the dose of radiation given to mother and her fetus.

If both tests are negative and there is high suspicion of PE, a V/Q (ventilation – perfusion) scan or CTPA (computed tomography pulmonary angiogram) should be performed.

Anticoagulant treatment should be continued until PE is definitively excluded.

Chest X-ray can identify other pulmonary diseases such as pneumonia, pneumothorax, or lobar collapse. Chest X-ray can be normal in over 50% women with PE. Abnormal features on X-ray chest due to PE include atelactasis, pleural effusion, focal opacities, regional oligaeemia or pulmonary oedema. **Women should be reassured that the radiation dose to fetus from X-ray chest performed at any stage of pregnancy is negligible.**

#### 15.2.2 Risk of V/Q and CTPA

Women should be explained where possible that V/Q scan carries slightly increased risk of childhood cancer compared with CTPA (1/280,000 Vs < 1,000,000) but carries a lower risk of maternal breast cancer (life time risk is increased by up to 13.6% with CTPA, background risk is 1/200).

CTPA is the first line investigation for diagnosis of non massive PE in non pregnant patients but has main disadvantage of increased life time risk of breast cancer due to high radiation dose to maternal breast. It has better sensitivity, specificity and can identify other pathologies such as aortic dissection. Despite potential advantages of CTPA, VQ scan is recommended as first line investigation due to its high negative predictive value and its substantially lower radiation dose to pregnant breast tissue.

Iodinated contrast medium with CTPA can potentially alter the fetal or neonatal thyroid function. **If CTPA is essential for pregnant women, thyroid function should be checked in the neonate.**

D-Dimers should not be performed for diagnosis of acute VTE in pregnant women.
15.2.3 Base line blood tests

Before commencing anticoagulant therapy blood should be taken for full blood count, coagulation screen, urea and electrolytes, and liver function tests. Performing a thrombophilia screen is not recommended as it will not alter the immediate management but it can provide information that can influence the duration and dose of anticoagulant. If thrombophilia screen is performed, one must appreciate that results are affected by pregnancy and presence of thrombus. The results therefore should only be interpreted by the Haematologist.

15.3 Treatment of VTE in Pregnancy

Low molecular weight heparin (LMWH) is the treatment of choice. This is because it is more effective and has lower risk of hemorrhagic complications. LMWH does not cross the placenta and is therefore safe in pregnancy and postnatal period.

Dose based on early booking weight and should not change.

<table>
<thead>
<tr>
<th>Weight (Kg)</th>
<th>Dalteparin Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50</td>
<td>5000 units twice daily</td>
</tr>
<tr>
<td>50-64</td>
<td>7500 units am &amp; 5000 units pm</td>
</tr>
<tr>
<td>65-79</td>
<td>7500 units twice daily</td>
</tr>
<tr>
<td>80-94</td>
<td>10,000 units am &amp; 7500 units pm</td>
</tr>
<tr>
<td>95-109</td>
<td>10,000 units twice daily</td>
</tr>
<tr>
<td>110-124</td>
<td>12,500 units am &amp; 10,000 units pm</td>
</tr>
<tr>
<td>125-139</td>
<td>12,500 units twice daily</td>
</tr>
<tr>
<td>140-154</td>
<td>15,000 units am &amp; 12,500 units pm</td>
</tr>
<tr>
<td>155-169</td>
<td>15,000 units twice daily</td>
</tr>
</tbody>
</table>

Dosage from Sheffield Shared Care Protocol for the prescription and supply of Dalteparin, Sheffield Area Prescribing Committee, January 2012

15.3.1 Monitoring of Women on LMWH

Baseline full blood count (FBC), coagulation screen, urea and electrolytes, liver function tests, accurate body weight. Repeat FBC within 24 hours if previous exposure to heparin. Repeat FBC once between days 5 & 7 and once between days 10 & 14 to detect HIT. Weekly potassium levels in patients at high risk of hyperkalaemia.

Routine measurement of anti-Xa levels is not required except women at extremes of weight such as less than 50kg or more than 90kg. Women with other complicating factors such as renal impairment or recurrent VTE also require monitoring of Anti-Xa. If unfractionated heparin is used for treatment of VTE in obstetric women, platelet count should be checked every 2-3 days from day 4 to day 14 or until heparin is stopped, whichever occurs first.
15.4 Massive PE

Women with massive PE can present with collapse and shock. In women with suspected massive PE on call medical team should be contacted urgently and consultant Obstetrician should review the patient.

An urgent CTPA or Echocardiogram should be arranged (within an hour of presentation). Immediate thrombolysis should be employed if diagnosis is confirmed. In circumstances where it is not possible to confirm diagnosis immediately but there is strong suspicion of massive PE, thromboplysis should be considered.

Intravenous unfractionated heparin is the initial treatment of massive PE. The decision to commence unfractionated heparin, thrombolytic treatment or thoractomy should be made by the consultant obstetrician, physician and haematologist.

15.4.1 Regimen for administration of unfractionated heparin

Loading dose 80units/kg followed by continues infusion of 18units/kg/hour

If a woman has received thrombolysis, loading dose of heparin should be omitted and infusion should be started at 18units/kg/hour.

Activated partial thromboplastin time (APTT) must be measured 4-6 hours after the loading dose, 6 hours after any dose change and at least daily when therapeutic range is achieved and dose stabilized. The therapeutic levels of APTT are 1.5-2.5 times the average laboratory control value.

See the table below for weight adjusted regimen. Infusion rates should be adjusted according to APTT as shown in table.

15.4.2 Infusion rates according to APTT

<table>
<thead>
<tr>
<th>APTT ratio</th>
<th>Dose Change (units/kg/hour)</th>
<th>Additional action</th>
<th>Next APTT (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1.2</td>
<td>+4</td>
<td>Re-Bolus 80units/kg</td>
<td>6</td>
</tr>
<tr>
<td>1.2-1.5</td>
<td>+2</td>
<td>Re-Bolus40units/kg</td>
<td>6</td>
</tr>
<tr>
<td>1.5-2.5</td>
<td>No change</td>
<td>-</td>
<td>24</td>
</tr>
<tr>
<td>2.5-3.0</td>
<td>-2</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>&gt;3.0</td>
<td>-3</td>
<td>Stop infusion 1 hour</td>
<td>6</td>
</tr>
</tbody>
</table>

In massive life threatening PE thrombolytic therapy should be considered. This can reduce the clot burden and rapidly improve the haemodynamics. There is however no evidence that thrombolytic therapy has any effect on long term survival compared to therapy with unfractionated heparin or LMWH. Because of this, thrombolytic therapy should be reserved for patients with severe pulmonary thromboembolism with haemodynamic compromise. Various thrombolytic agents can be used such as streptokinase, urokinase or tissue plasminogen activator. None of the thrombolytic agent is considered to be superior to others. The complications associated with thrombolytic therapy include non-fatal bleeding and fetal deaths.

If women is considered to be unsuitable for thrombolytic therapy or is moribund, cardiothoracic team should be involved for review to consider urgent thoracotomy and embolectomy.

15.5 Additional Treatments for VTE

In the initial management of DVT, elastic compression stockings should be applied and leg should be elevated to reduce odema. Mobilization with TED stockings should be encouraged. This helps to reduce the incidence of post thrombotic syndrome.

In cases where venous gangrene develops and there is risk to leg viability, leg should be elevated and anticoagulation given. Surgical embolectomy or thrombolytic therapy should be considered for these women.
Women diagnosed with iliac vein VTE should be considered for temporary inferior vena cava filter in the perinatal period to reduce the risk of embolization. This should also be considered in women who have confirmed DVT and continuing/recurrent PE. Although there is evidence that inferior vena cava filter prior to labour and delivery reduces the risk of PTE, women who develop VTE in the antenatal period, delivery should be delayed for as long as possible to allow time for anticoagulation rather than putting in filter and planning to deliver.

15.6 Maintenance Treatment of VTE

Therapeutic doses of subcutaneous heparin should be continued for the remainder of the pregnancy.

Out patient assessment should include clinical assessment as well as monitoring of Anti-Xa and platelet levels where indicated.

Women who are treated with unfractionated heparin should have platelet count monitored at least on alternate days and until day 14 or until heparin is stopped, which ever occurs first.

Women who develop heparin induced thrombocytopenia or are allergic to heparin should be given alternate agents for anticoagulation. These include heparinoid, Danaparoid sodium, fondaparinux. This should be decided after review/ consultation with haematologist.

Subcutaneous LMWH should be first line treatment for women with VTE and decision for unfractionated heparin should be made by senior Obstetrician in liaison with Hematologist.

Warfarin should not be used for treatment of VTE during pregnancy due to risk of fetal abnormalities associated with its use in the first trimester and risk of fetal and neonatal haemorrhage following trauma of delivery.

16 TREATMENT OF VTE DURING LABOUR AND DELIVERY

Women taking LMWH for VTE during pregnancy should be advised to stop injecting once they start contractions, have spontaneous rupture of membranes or experience any bleeding. They should be assessed by the obstetrician and further doses should be prescribed and administered by the medical staff.

Where delivery is planned, LMWH maintenance dose should be discontinued for 24 hours before planned delivery.

Regional anesthetic techniques should not be used for at least 24 hours after the last therapeutic dose of LMWH.

The thromboprophylactic dose of LMWH should be given 4 hours post-operatively or 4 hours after removal of the epidural catheter.

Therapeutic dose should be re started same evening if delivery was in the morning.

The epidural catheter should not be removed for 12 hours after the last dose of LMWH.

If spontaneous labour occurs in women on therapeutic does of unfractionated heparin, APTT should be checked and monitored carefully. If APTT is markedly prolonged near delivery, protamine sulphate may be required to reduce the risk of bleeding.

Subcutaneous unfractionated heparin should be discontinued 12 hours before and IV unfractionated heparin should be stopped 6 hours before induction of labour or regional anesthesia.

Women on therapeutic dosed of heparin should have been reviewed by the anesthetist in the antenatal period and on call anesthetist should be informed of their admission to labour ward.
In women receiving therapeutic doses of LMWH wound drains (abdominal and rectus sheath) should be considered and skin should be closed using staples or interrupted sutures to allow drainage of any hematoma.

Women who are thought to be at high risk of bleeding and in whom continued treatment with heparin is essential should be managed with intravenous Unfractionated heparin. Regular review by the senior obstetrician should take place and LMWH should be re started once risk of bleeding is considered to be low. Examples of such situations include major antepartum hemorrhage, coagulopathy, and progressive wound haematoma, suspected intra abdominal bleeding, and post partum hemorrhage.

17 POSTNATAL ANTICOAGULATION

Women who are on therapeutic heparin during pregnancy, should continue for at least 6 weeks postnatal or until at least 3 months of treatment has been completed. The reason for ongoing anticoagulation should be explained to the patient.

After delivery women should be given choice of oral anticoagulant or LMWH. The need for regular blood test particularly for first 10 days to monitor INR should be explained to the woman. Warfarin as well as LMWH is safe in breast feeding.

Warfarin should be avoided for at least 3 days after delivery and longer for women who are at increased risk of postpartum haemorrhage.

If women choose to continue with LMWH in postnatal period, then either doses given in antenatal period can be continued or recommended doses for non pregnant patients can be given.

If a women chooses to take warfarin, LMWH should be continued until INR is in the therapeutic range (between 2 -3). INR should be checked daily while changing from LMWH to warfarin and LMWH should be continued until INR is more than 2 on two consecutive days. This should also be discussed with the hematologist. INR should be maintained between 2-3.

Women on treatment should be referred to Hematologist for follow up and before discontinuing treatment continuing risk of thrombosis should be re assessed and personal and family history reviewed. Where indicated thrombophilia screen should be performed after discontinuing the treatment.

18 PREVENTION OF POST THROMBOTIC SYNDROME

Post thrombotic leg syndrome can affect over 60% of patients after a DVT. Characteristic feature include persistent leg pain, swelling, dependent cyanosis, sensation of heaviness, chronic pigmentation, eczema, telangiectasis, varicose veins, and in some case lipodermosclerosis and chronic ulceration. The syndrome is more common in patients who had recurrent DVT, are obese or had inadequate anticoagulation.

Women with DVT should be advised to wear elastic compression stocking on the affected leg for two years after the event to prevent and if already developed reduce the severity of symptoms.
19 POSTNATAL FOLLOW UP

Women that have been identified as at risk and/ or have been prescribed LMWH should have this documented on the discharge PROTOS by the Midwife responsible for discharge. A copy is sent to the CMW and to the GP for information.

Women who develop DVT during pregnancy or in postnatal period should have a follow up appointment at the Haematology clinic. Women should be assessed for post thrombotic syndrome, review of thrombophilia screen and repeat testing should be arranged if required. The woman should be discharged home with a full supply of Dalteparin.

The ward clerk will make an appointment for a postnatal review for two weeks after discharge. The women will also be seen by her dedicated consultant postnatally 6-8 weeks for review and regarding counselling as well as management of future pregnancies.

Women should also be advised regarding hormonal contraception and need for thromboprophylaxis in next pregnancy prior to discharge.

20 TRAINING

Newly ratified guidelines are uploaded to the intranet; staff are informed of this via the departmental newsletter. All staff have the responsibility to ensure awareness of the contents of the guideline.

Staff have the responsibility to inform their line manager of any training needs which may affect their ability to follow this guideline.

All relevant staff within the maternity unit will be made aware of the revised policy, to ensure correct dissemination. Training in the management of venous thromboembolism in pregnancy is mandatory for all staff as identified in the Training Needs Analysis.

20.1 Equality Impact Assessment

The Equality Impact Assessment for this policy is attached in Appendix A.
## 21 MONITORING COMPLIANCE

In order to monitor compliance the guideline will be audited in line with the Key Performance Indicators identified in the NHS Litigation Authority CNST Maternity Standards

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>Lead</th>
<th>Tool</th>
<th>Frequency</th>
<th>Reporting arrangements</th>
<th>Acting on recommendations and Lead(s)</th>
<th>Change in practice and lessons to be shared</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. appropriate and timely risk assessments to identify those at risk of VTE</td>
<td>Lead Consultant Obstetrician</td>
<td>A single audit tool will be used to capture the key elements of this policy</td>
<td>An annual audit of the key elements to be monitored will be carried out</td>
<td>The audit report will be submitted to the Maternity Quality Board.</td>
<td>The lead for any necessary action planning will be identified and actions will be agreed at the Maternity Quality Board meeting. The action plan will specify the time frame and will be monitored at the maternity quality board meetings.</td>
<td>Required changes in practice will be identified and implemented. Changes will be shared both internally and externally where appropriate</td>
</tr>
<tr>
<td>b. significance of signs and symptoms in light of known risk factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. actions to be taken in response to the risk assessments once the risk of VTE has been identified</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. requirement to document an individual management plan in the health records of women who require thromboprophylaxis or treatment for a diagnosis of VTE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. thromboprophylaxis during pregnancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. care during labour and delivery of women on thromboprophylaxis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. thromboprophylaxis during the postnatal period</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. management of massive life threatening pulmonary thromboembolism in pregnancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. 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</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
22 REFERENCES

Shared Care Protocol between Sheffield Teaching Hospitals NHS Foundation Trust and NHS Sheffield for the prescription and supply of Dalteparin (Fragmin®.) Dr McClean. January 2012.

23 ASSOCIATED DOCUMENTATION

Croydon Health Services NHS Trust Maternity Guideline –
Clinical Risk Assessment (Antenatal)
Clinical Risk Assessment (Labour)
Seriously Ill pregnant women

24 VERSION HISTORY TABLE

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Author</th>
<th>Ratified by</th>
<th>Comment/Reason for change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>October 2008</td>
<td>Rosol Hamid</td>
<td>Maternity Policy Review Group</td>
<td>New Document</td>
</tr>
<tr>
<td>2.0</td>
<td>October 2009</td>
<td>Usma Aziz</td>
<td>Maternity Quality Board</td>
<td>Updated Document</td>
</tr>
<tr>
<td>3.0</td>
<td>September 2010</td>
<td>Yasmin Sana</td>
<td>Maternity Quality Board</td>
<td>Updated Document</td>
</tr>
<tr>
<td>3.1</td>
<td>February 2011</td>
<td>Yasmin Sana</td>
<td>Directorate Services Meeting</td>
<td>Updated Document to include using women’s booking weight for dose calculation</td>
</tr>
<tr>
<td>3.2</td>
<td>July 2012</td>
<td>Bini Ajay</td>
<td>Maternity Quality Board</td>
<td>Updated document</td>
</tr>
<tr>
<td>3.3</td>
<td>Oct 2012</td>
<td>Bini Ajay</td>
<td>Maternity Quality Board</td>
<td>Updated document</td>
</tr>
<tr>
<td>-----</td>
<td>----------</td>
<td>-----------</td>
<td>-------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>3.4</td>
<td>January 2013</td>
<td>Karen zedgitt</td>
<td>Maternity Quality Board</td>
<td>Monitoring section adjusted in order to monitor the compliance of the guideline in line with the Key Performance Indicators identified in the NHS Litigation Authority CNST Maternity Standards</td>
</tr>
</tbody>
</table>
## APPENDIX A – EQUALITY IMPACT ASSESSMENT

<table>
<thead>
<tr>
<th></th>
<th>Yes/No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> Does the policy/guidance affect one group less or more favourably than another on the basis of:</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Race</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Ethnic origins (including gypsies and travellers)</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Nationality</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Culture</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Religion or belief</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Sexual orientation including lesbian, gay and bisexual people</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Disability - learning disabilities, physical disability, sensory impairment and mental health problems</td>
<td>No</td>
</tr>
<tr>
<td><strong>2.</strong> Is there any evidence that some groups are affected differently?</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td><strong>3.</strong> If you have identified potential discrimination, are there any exceptions valid, legal and/or justifiable?</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td><strong>4.</strong> Is the impact of the policy/guidance likely to be negative?</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td><strong>5.</strong> If so can the impact be avoided?</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td><strong>6.</strong> What alternative are there to achieving the policy/guidance without the impact?</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td><strong>7.</strong> Can we reduce the impact by taking different action?</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

If you have identified a potential discriminatory impact of this procedural document, please refer it to Beverly Reyes-Roberts, together with any suggestions as to the action required to avoid/reduce this impact.

For advice in respect of answering the above questions, please contact Beverly Reyes-Roberts extn 3168.
APPENDIX B – CONSULTATION TEMPLATE

1. Procedural Document’s Name: Maternity Guideline – Venous Thromboembolism
2. Procedural Document Author: Bini Ajay
3. Group/Committee Consulted: Thrombosis Committee, Medicines Management Committee
4. Date of Consultation: 3 August 2012
5. Comments Received:

   **Medicine Management Committee 10 July 2012**

   Page 8 Add in The obstetrician will prescribe LMWH. Any woman prescribed LMWH will continue under obstetric led care and attend the antenatal clinic for on-going monitoring of dosage

   Page 10 Add in The LMWH is prescribed by the Anaesthetist present at the caeserean section. The obstetrician team will ensure that TTA’s are prescribed prior to the woman’s discharge home.

   **Thrombosis Committee 3 August 2012**

   Page 5 VTE risk assessment at booking must be undertaken whatever gestation the booking occurs

   Page 17 Warfarin should not be used for treatment of VTE during pregnancy due to risk of fetal abnormalities associated with its use in the first trimester and risk of fetal and neonatal haemorrhage following trauma of delivery.

   Page 18 The reason for ongoing anticoagulation should be explained to the patient.

   Page 18 The need for regular blood test particularly for first 10 days to monitor INR should be explained to the woman

   Page 19 Add in The woman should be diacharged home with a full supply of Dalteparin

   Page 19 Take out The woman will remain under the care of a consultant haematologist with another follow up appointment 6 weeks post delivery with a view to discontining thromboprophylaxis following a thrombophilia screen.

   MMC 14/8/12

   Changes recommended by medical Director & DOM
   Front page – Needs to state that this is a maternity guideline.

   Pictorial example of postnatal risk assessment, clarifying parity

   Risk Assessments appendix made clearer

6. Highlight where policy changed following consultation or state reasoning why comments not incorporated:
## APPENDIX C – ANTENATAL RISK ASSESSMENT AND MANAGEMENT

### Patient Information

- **Name** …………
- **D.O.B** ……
- **Hospital Number**……..

### Date Assessment Performed

At booking □ On admission to ward □ Inpatient episode >3 day □ 36-38 weeks Gestation □

### Please tick the boxes

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single previous VTE + Thrombophilia or family history</td>
<td>High Risk</td>
</tr>
<tr>
<td>Single previous unprovoked or oestrogen related VTE</td>
<td>Requires antenatal prophylaxis with LMWH.</td>
</tr>
<tr>
<td>Previous Recurrent VTE (&gt;1)</td>
<td>Refer to Haematologist/Obstetrician.</td>
</tr>
<tr>
<td>Single previous VTE with no family history or thrombophilia</td>
<td>Intermediate Risk</td>
</tr>
<tr>
<td>Thrombophilia + no VTE</td>
<td>Consider antenatal prophylaxis with LMWH.</td>
</tr>
<tr>
<td>IV drug user</td>
<td>Seek advice from Obstetrician/Haematologist.</td>
</tr>
<tr>
<td>Surgical procedure e.g. appendicectomy</td>
<td></td>
</tr>
<tr>
<td>Medical conditions e.g. heart or lung disease, cancer, inflammatory conditions, nephritic syndrome, sickle cell disease</td>
<td></td>
</tr>
<tr>
<td>Age &gt;35</td>
<td></td>
</tr>
<tr>
<td>Obesity (BMI &gt;30)</td>
<td></td>
</tr>
<tr>
<td>Parity &gt;3</td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td></td>
</tr>
<tr>
<td>Gross varicose veins</td>
<td></td>
</tr>
<tr>
<td>Current Systemic Infection</td>
<td></td>
</tr>
<tr>
<td>Immobility e.g. paraplegia, SPD, Long distance travel</td>
<td></td>
</tr>
<tr>
<td>Pre-eclampsia</td>
<td></td>
</tr>
<tr>
<td>Dehydration/ Hyperemesis/OHSS</td>
<td></td>
</tr>
<tr>
<td>Multiple Pregnancy</td>
<td></td>
</tr>
</tbody>
</table>

### LMWH required

- **Yes □ No □**

### LMWH Prescribed

- **Yes □ No □** (Please Tick)

Name and Signature of MW/Doctor performing the assessment…………………………..
APPENDIX D – POSTNATAL RISK ASSESSMENT AND MANAGEMENT

Name …………… D.O.B …….. Hospital Number ……..

Date Assessment Performed ………………………..

Immediately postnatal □ Postnatal Inpatient episode >3 days □

Please tick the boxes

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>High Risk</th>
<th>Intermediate Risk</th>
<th>Lower risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any Previous VTE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anyone requiring antenatal LMWH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caesarean section</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asymptomatic thrombophilia (inherited or acquired)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI &gt; 40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prolonged hospital admission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical conditions e.g. heart and lung disease, Sickle Cell Disease, SLE, Cancer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV drug user</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

High Risk
At least 6 weeks Postnatal Prophylactic LMWH, TED stockings

Intermediate Risk
At least 7 days postnatal prophylactic LMWH
If persistent or > 3 risk factors, consider extending prophylaxis with LMWH, TED stockings

2 or more risk factors

< 2 risk factors

Lower risk
Mobilization and avoidance of dehydration

LMWH required Yes □ No □
LMWH Prescribed Yes □ No □
(Please Tick)

Name and Signature of MW/Doctor performing the assessment ……………………..

January 2013
## APPENDIX E - POSTNATAL WARFARIN THERAPY PROTOCOL

<table>
<thead>
<tr>
<th>Day of Treatment</th>
<th>INR</th>
<th>Dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>-</td>
<td>7.0</td>
</tr>
<tr>
<td>Second</td>
<td>-</td>
<td>7.0</td>
</tr>
<tr>
<td>Third</td>
<td>&lt;2.0</td>
<td>7.0</td>
</tr>
<tr>
<td></td>
<td>2.0 – 2.1</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>2.2 – 2.3</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>2.4 – 2.5</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>2.6 – 2.7</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>2.8 – 2.9</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>3.0 – 3.1</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>3.2 – 3.3</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>3.4</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>3.5</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>3.6</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>&gt;4.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Fourth</td>
<td>&lt;1.4</td>
<td>&gt;8.0</td>
</tr>
<tr>
<td></td>
<td>1.4</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>1.5</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>1.6 – 1.7</td>
<td>7.0</td>
</tr>
<tr>
<td></td>
<td>1.8</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>1.9</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>2.0 – 2.1</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>2.2 – 2.3</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>2.4 – 2.6</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>2.7 – 3.0</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>3.1 – 3.5</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>3.6 – 4.0</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>4.1 – 4.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;4.5</td>
<td></td>
</tr>
</tbody>
</table>

Omit next day’s dose then give 2mg
Omit two day’s doses then give 1mg