Whittington Health NHS

Venous Thromboembolism in Pregnancy and the Puerperium: Acute Management

Subject:	Venous Thromboembolism
Policy Number	
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Policy Executive Owner:	Miss C Biswas
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Version Control Sheet

Version	Date	Author	Status	Comment
1	2007	Miss G Henson	Consultant Obstetrician	New guideline
2	October 2010	Miss Kyei-Mensah	Consultant Obstetrician	Update
3	October 2015	Miss Kyei-Mensah Christina Legit	Consultant Obstetrician ST7 - Obstetrics	Update

➢ Criteria for use

Any pregnant women in whom **Venous Thromboembolism** (VTE) is suspected or diagnosed during pregnancy or the puerperium. It does not address thromboprophylaxis in obstetric and gynecological practice.

Please see Whittington Health Guideline:

'***Thromboembolism prophylaxis during and after pregnancy***

Please see Whittington Hospital NHS Trust Guideline: See also the RCOG Green Top Guideline No 37b (Thromboembolic Disease in Pregnancy and the Puerperium: Acute Management)

➢ Background/ introduction

Venous Thromboembolism includes Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE).

Thrombosis and thromboembolism remain the leading cause of direct maternal death in the UK. (MBRRACE UK 2009-2012)

The mortality rate is 1.56/100 000 maternities[1].

Sequential Confidential Enquiries into Maternal Deaths have highlighted failures in obtaining objective diagnoses and employing adequate treatment. It is not surprising that thrombosis and thromboembolism remain the leading cause for maternal death given the known association with obesity and rising rates of obesity in the pregnant population.

Any woman with signs and symptoms suggestive of VTE should undergo diagnostic tests and receive treatment with low molecular weight heparin (LMWH) until the diagnosis is excluded by objective testing unless treatment is strongly contraindicated. Baseline observations must be continued and documented in the woman's notes.

The subjective clinical assessment of DVT and PE is unreliable and less than half of women with clinically suspected VTE have the diagnosis confirmed when objective testing is employed.

VTE can occur at any stage in pregnancy but the puerperium is the time of highest risk. 66% of maternal deaths from VTE occur in the first trimester.

Acute VTE should be suspected at any time during pregnancy or the puerperium in women with risk factors for VTE (see Appendix 1)

➢ Clinical management

The symptoms and signs of VTE

DVT: leg pain or discomfort (especially in the left leg), swelling, tenderness, increased temperature and oedema, lower abdominal pain and elevated white cell count.

PTE: dyspnoea, haemoptysis, chest pain, faintness, collapse**,** raised JVP, focal chest signs, symptoms and signs associated with DVT.

Diagnostic imaging to be performed at the Whittington:

DVT - Compression Duplex ultrasound

PE - ECG and CXR.

Suspected PE with symptoms and signs of DVT

Compression duplex ultrasound should be performed.

Suspected PE without symptoms and signs of DVT

VQ scan or CTPA should be performed.

If CXR is abnormal or cardiorespiratory disease present

*CTPA should be performed in preference to a VQ scan.

*discuss with Consultant Radiologist.

Suspected VTE:

DVT:

If Compression duplex USS is negative with low level of clinical suspicion

Treatment can be discontinued.

If Compression duplex USS is negative with high level of clinical suspicion

Treatment should be discontinued but the USS should be repeated on D3 and D7

The vast majority of DVTs in pregnancy are ileofemoral and will therefore require treatment.

Isolated below knee DVT is uncommon but, if diagnosed, treatment should be given (unlike in the non-pregnant state).

PE:

VQ scan or CTPA is normal but the clinical suspicion of PTE remains.

Alternative or repeat testing should be carried out

Anticoagulant treatment should continue until PE is definitely excluded.

Confirmed VTE:

DVT

If Compression Duplex Ultrasound confirms the diagnosis of DVT, anticoagulant

treatment should be continued.

PE

If Compression Duplex Ultrasound is positive in women who have concurrent signs and symptoms of a DVT treatment should be continued.

PTE has not been proven but the treatment will be the same for DVT or PE.

Baseline assessment before initiating anticoagulant therapy:

Before anticoagulant treatment is commenced, blood should be taken to exclude renal or hepatic dysfunction which are cautions for anticoagulant therapy.

- full blood count, coagulation screen
- urea and electrolytes, creatinine
- liver function tests

Anticoagulant treatment with Low Molecular Weight Heparin (LMWH):

Low molecular weight heparin is the treatment of choice for patients with DVT and PTE that is not massive.

Tinzaparin is the low molecular weight heparin being used in Whittington Health.

The woman's booking weight should be used to determine the required dose of Tinzaparin.

Booking weight should be documented on JAC or at the front of a paper drug chart, at the time of prescribing.

If booking weight is unknown use the most recent weight to guide dosage.

Tinzaparin treatment dose

The dose of Tinzaparin is **175 units per kg for all weights** given as a **once daily dose**.

Routine measurement of anti-Xa activity is not recommended except for women at extremes of body weight i.e. less than 50kg and more than 90 kg or with other complicating factors such as renal disease or recurrent VTE.

Routine platelet count monitoring is not needed unless unfractionated heparin has been given during this admission or in the past.

Referral to Obstetric Medicine Team:

The woman should be referred to the Obstetric Medicine Team via switchboard (09.00 - 17.00 hrs). Miss Kyei-Mensah or Mr Ashokkumar, (Consultant Obstetricians, maternal medicine specialists).

The Obstetric Consultant on call should also be informed

Other treatment measures:

- In the initial management of DVT, the leg should be elevated
- A graduated elastic compression (TED) stocking applied to reduce oedema.
- Mobilisation with TED stockings should be encouraged.
- **In massive PE, recurrent pulmonary emboli** despite adequate anticoagulation or imaging suggestive of unstable thrombus, seek advice from the on-call Consultant Radiologist and Intensive Care Consultant.
- **If life-threatening massive PE** occurs, cardiopulmonary resuscitation will usually be required and **intravenous unfractionated heparin should be given**.
- Thrombolytic therapy with streptokinase, percutaneous catheter thrombus fragmentation or surgical embolectomy in pregnancy is very rarely needed and would only be considered after multidisciplinary discussion.

Anticoagulant treatment with intravenous unfractionated heparin

Massive PE

Intravenous unfractionated heparin remains the preferred treatment because of its rapid effect and extensive experience of its use in this situation.

Regimen for the administration of intravenous unfractionated heparin

Use Heparin Sodium 5000units/ml ampoule

NOTE: The preparation of Heparin Sodium is a ready-diluted solution so no need to dilute further.

Loading dose**:** Heparin Sodium 5000 units over 5 mins

Followed by:

Continuous intravenous infusion of 1000 - 2000 units/hour

Titrate by at least daily laboratory results of activated partial thromboplastin time (**APTT**).

An initial infusion concentration of 1000 units/ml should be used.

Draw up 2 ampoules of heparin sodium infusion (40,000 units / 40 ml) in a 50 ml syringe for a final concentration of 1000 units / ml.

Measure APTT level 6 hours post loading dose or any dose change then at least daily when in the therapeutic range. Aim to reach the therapeutic target range within 24 hours.

Obstetric patients who are postoperative and receiving unfractionated heparin

Check the platelet count monitoring every 2–3 days from days 4 to 14 or until heparin is stopped.

The therapeutic target APTT ratio is **1.5 - 2.5 times the lab control value**.

Long term administration of unfractionated heparin requires anti-Xa monitoring. Contact Dr Cohen (Consultant Haematologist, UCLH) to arrange assays at UCLH. The anti-Xa target range is 0.35 - 0.70 iu/ml.)

Please see Whittington Health Guideline:

'Unfractioned Heparin Infusion Guideline'

Maintenance treatment with Tinzaparin

Treatment with therapeutic doses of LMWH :

Continue for the remainder of the pregnancy and for at least 6 weeks postnatally

Continue until at least 3 months of treatment has been given in total.

Before discontinuing treatment the continuing risk of thrombosis should be assessed.

Women should be taught to self-inject and can then be managed as out-patients until delivery.

Make arrangements to facilitate the safe disposal of all sharps.

The very small risk of bone demineralisation should be discussed with the woman and documented

Arrange follow-up in The Obstetric Medicine Clinic (Monday mornings, Antenatal Clinic).

Maintenance treatment with Warfarin

If the VTE is diagnosed antenatally a few women may opt for maintenance treatment with warfarin until 36 weeks gestation or the time of planned delivery. **The risks must have been discussed with the woman by the Obstetric Medicine Team.**

If the VTE is diagnosed postnatally some women will prefer to take Warfarin than inject themselves daily with LMWH.

If VTE was diagnosed antenatally the woman should be offered a choice of LMWH or Warfarin postnatally after discussion about the need for regular blood test monitoring.

Postpartum warfarin should be avoided **until at least the 5th day and for longer in women at increased risk of postpartum haemorrhage.**

Breast feeding is not contraindicated in women taking Warfarin or LMWH.

Please see Whittington Health Guideline:

'Warfarin – Prescribing for Inpatients

Anticoagulant therapy during labour and delivery, including the use of epidurals

The use of regional analgesia or anaesthesia in a woman who has had an

anticoagulant carries the rare, but devastating risk of a spinal haematoma. Permanent neurological damage (paraplegia) could result if this was not treated within 6-8 hours.

Regional anaesthetic techniques **should not be undertaken for at least 24 hours after the last dose of therapeutic LMWH,** assuming it is given once daily.

Twice daily dosage of LMWH increases the risk of bleeding therefore regional techniques are contraindicated until 24 hours have elapsed since the last dose.

For this reason **once daily LMWH administration is the preferred option.**

The woman should be advised not to inject any further LMWH once she suspects that she is in labour.

For planned elective caesarean section or induction of labour

LMWH maintenance therapy should be discontinued 24 hours prior to planned delivery.

If the woman has an epidural for labour, LMWH can be resumed 4 hours after the epidural catheter has been removed.

Epidural catheters must not be removed within 12 hours of the last LMWH injection

In women treated for VTE since early pregnancy

It may be appropriate to temporarily reduce the dose of LMWH at the end of pregnancy in anticipation of delivery to reduce the risk of bleeding at delivery and to facilitate access to regional analgesia/anaesthesia.

If VTE occurs at term

Consider the use of intravenous unfractionated heparin which is more easily manipulated.

Please discuss any woman with liver or kidney dysfunction with a consultant anaesthetist. Renal and hepatic disease can prolong the action of LMWH.

	Please see Whittington Health Guideline: **'Thromboprophylaxis during and after pregnancy'**

	Please see Whittington Health Guideline: **'Regional Neuraxial blocks for patients on Anticoagulant Treatment'**

Postnatal anticoagulation

Therapeutic anticoagulant therapy

Continue for the remainder of the pregnancy and for at least 6 weeks postnatally

Continue until at least 3 months of treatment has been given in total.

Before discontinuing treatment the continuing risk of thrombosis should be assessed.

Offer the woman a choice of LMWH or oral anticoagulant for postnatal therapy after discussing the need for regular blood tests for monitoring of warfarin, particularly during the first 10 days of treatment.

Anticoagulation with LMWH or Warfarin should be **continued for 3 - 6 months post delivery**.

Women taking warfarin will be referred to The Whittington Anticoagulation Clinic for INR monitoring.

Haematology Clinic review will take place after the anticoagulation has been completed.

Prevention of post-thrombotic syndrome

Advise women that prolonged use of LMWH (more than 3 months) is associated with a significantly lower chance of developing post-thrombotic syndrome.

Following a DVT graduated elastic compression (TED) stockings should be worn on the affected leg to reduce pain and swelling.

Advise women that the role of compression stockings in the prevention of post-thrombotic syndrome is unclear.

➢ Contacts (inside and outside the Trust including out-of-hours contacts)

Consultant Obstetrician on-call via switchboard

Consultant Haematologist on–call via switchboard

Consultant Anaesthetist on-call via switchboard

Obstetric Medicine Team (Miss Kyei-Mensah / Mr Ashokkumar / Dr David Williams*)

*via switchboard at UCL

➢ References (evidence upon which the guideline is based)

1. Saving Lives – Improving Mothers Care (MBRRACE UK 2009-2012) – Mbrrace, December 2014
2. Thromboembolic disease in Pregnancy and the Puerperium: Acute Management. Green Top Guideline No 37b. April 2015
3. Handbook of Obstetric Medicine 3rd Edition Catherine Nelson-Piercy. Informa Healthcare. Chapter 3 p. 45 - 64.

- **Compliance with this guideline (how and when the guideline will be monitored e.g. audit and which committee the results will be reported to) Please use the tool provided at the end of this template**

To be completed and attached to any procedural document when submitted to the appropriate committee for consideration and approval

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

If you have identified a potential discriminatory impact of this procedural document, please refer it to the Director of Human Resources, 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 the Director of Human Resources.

Checklist for the Review and Approval of Procedural Document

To be completed and attached to any procedural document when submitted to the relevant committee for consideration and approval.

	Title of document being reviewed:	Yes/No	Comments
1.	**Title**		
	Is the title clear and unambiguous?	Yes	
	Is it clear whether the document is a guideline, policy, protocol or standard?	Yes	
2.	**Rationale**		
	Are reasons for development of the document stated?	Yes	
3.	**Development Process**		
	Is it clear that the relevant people/groups have been involved in the development of the document?	Yes	
	Are people involved in the development?	Yes	
	Is there evidence of consultation with stakeholders and users?	Yes	
4.	**Content**		
	Is the objective of the document clear?	Yes	
	Is the target population clear and unambiguous?	Yes	
	Are the intended outcomes described?	Yes	
5.	**Evidence Base**		
	Are key references cited in full?	N/A	
	Are supporting documents referenced?	N/A	
6.	**Approval**		
	Does the document identify which committee/ group will approve it?	Yes	
7.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?	Yes	
8.	**Document Control**		
	Does the document identify where it will be held?	Yes	
9.	**Process to Monitor Compliance and Effectiveness**		

	Title of document being reviewed:	Yes/No	Comments
	Are there measurable standards or KPIs to support the monitoring of compliance with and effectiveness of the document?	Yes	
	Is there a plan to review or audit compliance with the document?	Yes	
10.	**Review Date**		
	Is the review date identified?	Yes	
	Is the frequency of review identified? If so is it acceptable?	Yes	
11.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for co-ordinating the dissemination, implementation and review of the document?	Yes	

Executive Sponsor Approval			
If you approve the document, please sign and date it and forward to the author. Procedural documents will not be forwarded for ratification without Executive Sponsor Approval			
Name		Date	
Signature			
Relevant Committee Approval			
The Director of Nursing and Patient Experience's signature below confirms that this procedural document was ratified by the appropriate Governance Committee.			
Name		Date	
Signature			
Responsible Committee Approval – only applies to reviewed procedural documents with minor changes			
The Committee Chair's signature below confirms that this procedural document was ratified by the responsible Committee			
Name		Date	
Name of Committee		Name & role of Committee Chair	
Signature			

Tool to Develop Monitoring Arrangements for Policies and guidelines

What key element(s) need(s) monitoring as per local approved policy or guidance?	Who will lead on this aspect of monitoring? Name the lead and what is the role of the multidisciplinary team or others if any.	What tool will be used to monitor/check/observe/Assess/inspect/ authenticate that everything is working according to this key element from the approved policy?	How often is the need to monitor each element? How often is the need complete a report ? How often is the need to share the report?	What committee will the completed report go to?
Element to be monitored	**Lead**	**Tool**	**Frequency**	**Reporting arrangements**
Appropriate and timely management of women suspected or diagnosed as having a venous thromboembolism Appropriate drug treatment with anticoagulants Appropriate referral to Obstetric Medicine team Appropriate treatment andfollow-up after delivery	Ms Kyei-Mensah Obstetrician	An annual continuous audit	An annual continuous audit	These reports will be reviewed by the Maternity Clinical Guidelines and Audit Group. It is their responsibility to monitor the findings from each report. Evidence to support this will be found in the form minutes. Key factors to be noted are: -Audit findings -Deficiencies -Whether this is improvement from previous audit findings -Action planning with a named person who is responsible -Next date where an update will be given and by whom

Appendix One:

Risk factors for venous thromboembolism in pregnancy

 Age over 35 years
 Immobility
 Obesity
 Operative delivery
 Pre-eclampsia
 Parity greater than 4
 Surgical procedure in pregnancy or puerperium, e.g. postpartum sterilisation
 Previous DVT
 Thrombophilia
- *Congenital:antithrombin deficiency*
- *Protein C deficiency*
- *Protein S deficiency*
- *Factor V Leiden*
- *Prothrombin gene variant*
- *Acquired:lupus anticoagulant*
- *Anticardiolipin antibodies*
 Excessive blood loss
 Paraplegia
 Sickle cell disease
 Inflammatory disorders and infection, e.g. inflammatory bowel disease and urinary tract infection
 Dehydration