

MATERNITY GUIDELINES

Thromboprophylaxis and Management of VTE in Pregnancy and the Puerperium

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1. Introduction

- About 8-10 women die each year due to thromboembolism and it accounts for almost 1 in 4 direct maternal deaths (CEMACH, 2007).
- Pregnancy increases the risk by 6-10 fold; caesarean section further increases the risk by 10-20 fold. **Emergency caesarean section is associated with a higher risk than the elective CS.**

2. Clinical features of DVT and PE

2.1. Signs and symptoms of DVT

- **Clinical signs of swelling, redness, pain and tenderness of the calf may be unreliable in pregnancy**, and clinical assessment should be followed-up with diagnostic tests.

2.2. Signs and symptoms PE

- Breathlessness and pleuritic pain especially of sudden onset
- Cough / haemoptysis
- Sudden central chest pain
- Sudden collapse
- Signs - tachycardia, tachypnoea, raised JVP, pleural rub, loud second heart sound and right ventricular heave

2.3 Objective diagnosis essential for both DVT and PE

DVT

- Ilio-femoral thrombosis is more common than popliteal-femoral thrombosis during pregnancy
- Perform duplex Doppler ultrasound of symptomatic leg. If iliac vein thrombosis is suspected and leg USS negative, the clinician must specifically request USS imaging of pelvic iliac vessels to level of bifurcation, which is possible by skilled US practitioners
- Request venography with abdominal shielding if USS difficult to perform (i.e. morbid obesity)

PE

- Chest x-ray
- Bilateral lower limb venous Doppler
- ECG
- Arterial blood gases

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- Ventilation / perfusion scan (V/Q scan)
- Consider cardiac echo to eliminate right heart strain

Ovarian Vein Thrombosis

This is a postnatal complication where maternal sepsis fails to respond to antibiotics. Any woman with this, or symptoms of abdominal pain needs imaging to exclude this diagnosis. 1st line is USS pelvis by an experienced practitioner. If unable to gain clear views (eg raised BMI) options of MRI with contrast or CT pelvis with contrast needs to be discussed with the duty radiology consultant. Her clinical picture will not improve until she receives therapeutic anticoagulation with LMWH and antibiotics as the underlying pathology is an infected thrombus.

2.4 Treatment

Start treatment once VTE or PE suspected; do not wait for confirmation of diagnosis. Stop treatment if alternative diagnosis made.

Confirmed DVT or PE should be treated with clexane and consideration given to the use of IV heparin, according to clinical need. The choice of treatment should be made at level of senior clinician.

For those with a DVT graduated compression stockings may also be considered.

See appendix 1 for treatment flowchart

3. Risk assessment and management for VTE

3.1 Risk assessment:

Assessment for risk of venous thromboembolism (VTE) should occur as part of the regular risk assessments carried out, as a minimum, at booking, antenatal admission to hospital, during labour and in the postnatal period. The form for antenatal and postnatal risk assessments are shown in appendix 2 and 3, respectively. These assessments should be completed at the recommended intervals and retained within the patient healthcare record.

3.2 Management:

Please refer to appendix 2 and 3 for treatment pathways.

Any patient who is either on a high dose of prophylactic LMWH, therapeutic LMWH, or extremes of weight (less than 50Kg or greater than 100Kg) needs to have an anti-Xa peak post dose blood test performed 3 hours after a regular dose. Blood tests are performed on

Day Assessment. Contact the ward to arrange an appointment for a few days after the start of the treatment and they will be repeated as required.

Ensure that a recent FBC has been obtained. An antenatal clinic appointment will be required and the consultant haematologist will be informed by DAU. Patient information leaflets for prophylactic and therapeutic LMWH are available.

4. Intrapartum management for women receiving clexane / heparin

- Documented individualised care plan during antenatal period for high-risk women (i.e. IV heparin antenatal metal heart valves)
- Documented individualised care plan during antenatal period for women using therapeutic or prophylactic clexane.

Home birth is not advisable.

- Omit therapeutic clexane 24 hours prior to start of labour
- Omit prophylactic clexane 12 hours prior to start of labour

Once the woman thinks she may be in early labour, she should be advised not to inject any further heparin until medical review and cervical assessment. If already in labour discuss with consultant obstetrician and haematologist re: plan of care. Inform anaesthetist if epidural / operative delivery is required

Spontaneous labour is acceptable for most women, particularly if primiparous.

- Active management 3rd stage.
- Post-partum Syntocinon regime should be considered if delivery within 12 hours of prophylactic dose.

IOL

- Omit the evening dose.
- Consider a prophylactic dose (Fragmin dose weight adjusted as below) on the day of IOL If the cervix is unfavourable and labour unlikely.

Elective LSCS

- Omit the evening dose.

5. Postpartum management:

The postpartum period is the greatest risk period for women.

- All women should be assessed before and immediately after delivery for the risk factors – see appendix 3.
- All women should be encouraged to mobilize both during labour and postpartum. Dehydration should be avoided.

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- Women should be informed of and encouraged to report any signs and symptoms of VTE and / or risks (see page 3 of postnatal notes)
- Women should be repeatedly assessed for risk factors for VTE if they develop intercurrent problems or require surgery in the puerperium.
- Commence treatment if required

The risk of VTE reduces when women are mobile postpartum but does not disappear. If the woman is discharged home early, her thromboprophylaxis including TEDS should be continued at home, to complete the course of 10 days.

Where prophylaxis is required, LMWH should be introduced or re-introduced as soon as possible after delivery, provided that there is no postpartum haemorrhage.

- 2 hours after vaginal delivery
- 4 hours after removal of epidural catheter.
- 4 hours after LSCS
- Those with postpartum haemorrhage should be fitted with TED stockings until LMWH can be re-started.

If the woman has been given regional analgesia, LMWH should be withheld until 4 hours after insertion or removal of the epidural catheter (or six hours if either insertion or removal were traumatic). The first postpartum dose can be given after insertion but before removal of the epidural catheter, in which case removal should be delayed for 10-12 hours

Continuation of antenatal treatment:

- The A/N therapeutic and prophylactic dose of clexane should be recommencing when risk of primary PPH is low.
- Individual care plan for high risk women should be documented in the notes by consultant team.

Length of prophylaxis (usually 6 weeks) may be prolonged where clinically indicated.

All women should be made aware of the need to contact the midwife or doctor with any leg or chest symptoms and these women must always be referred to the maternity unit for further investigation, regardless of mode of delivery or absence of risk factors.

Use of Warfarin

Although Warfarin has been prescribed in the past from 5th-7th day postpartum, complications with severe secondary postpartum haemorrhages has led to a change of management.

A continuation of LMWH for 6 weeks is recommended, until the uterus is back to normal size. The GP can then transfer the patient to warfarin, heparin or oral anticoagulation.

Of note when someone is on full therapeutic LMWH and INR is >1.5 they are on almost full double anticoagulation, so should have the LMWH halved until the INR is in therapeutic range (which will depend on the underlying pathology of each woman).

6. Management of sudden maternal collapse

See maternity guideline: Enhanced Observation Room

6.1 Management of massive life-threatening PTE

Collapsed, shocked patients need to be assessed by a team of experienced clinicians, including the on-call consultant obstetrician. The decision should be made on an individual basis whether a woman receives IV unfractionated heparin, thrombolytic therapy or thoracotomy and surgical embolectomy.

The on-call medical team should be contacted immediately. An urgent portable echocardiogram or computed tomography pulmonary angiogram (CTPA) within 1 hour of presentation should be arranged. If massive PTE is confirmed or, in extreme circumstances prior to confirmation, immediate thrombolysis should be considered.

Administration of IV unfractionated heparin is the preferred treatment of choice and must be prescribed under the direction of senior clinicians. Intravenous unfractionated heparin is the traditional method of heparin administration in acute VTE and remains the preferred treatment in massive PTE because of its rapid effect and extensive experience of its use in this situation.

A regimen for the administration of intravenous, unfractionated heparin is:

- loading dose of 80 units/kg, followed by a continuous intravenous infusion of 18 units/kg/hour
- if a woman has received thrombolysis, the loading dose of heparin should be omitted and an infusion started at 18 units/kg/hour and adjusted according to table 1.
- it is mandatory to measure activated partial thromboplastin time (APTT) 4–6 hours after the loading dose, 6 hours after any dose change and then at least daily when in the therapeutic range. The therapeutic target APTT ratio is usually 1.5–2.5 times the average laboratory control value.

Table 1. Infusion rates according to APTT

APTT ratio	Dose change (units/kg/hour)	Additional action	Next APTT (hours)
< 1.2	+ 4	Re-bolus 80 units/kg	6
1.2–1.5	+ 2	Re-bolus 40 units/kg	6
1.5–2.5	No change		24
2.5–3.0	– 2		6
> 3.0	– 3	Stop infusion 1 hour	6

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7. Postnatal follow-up

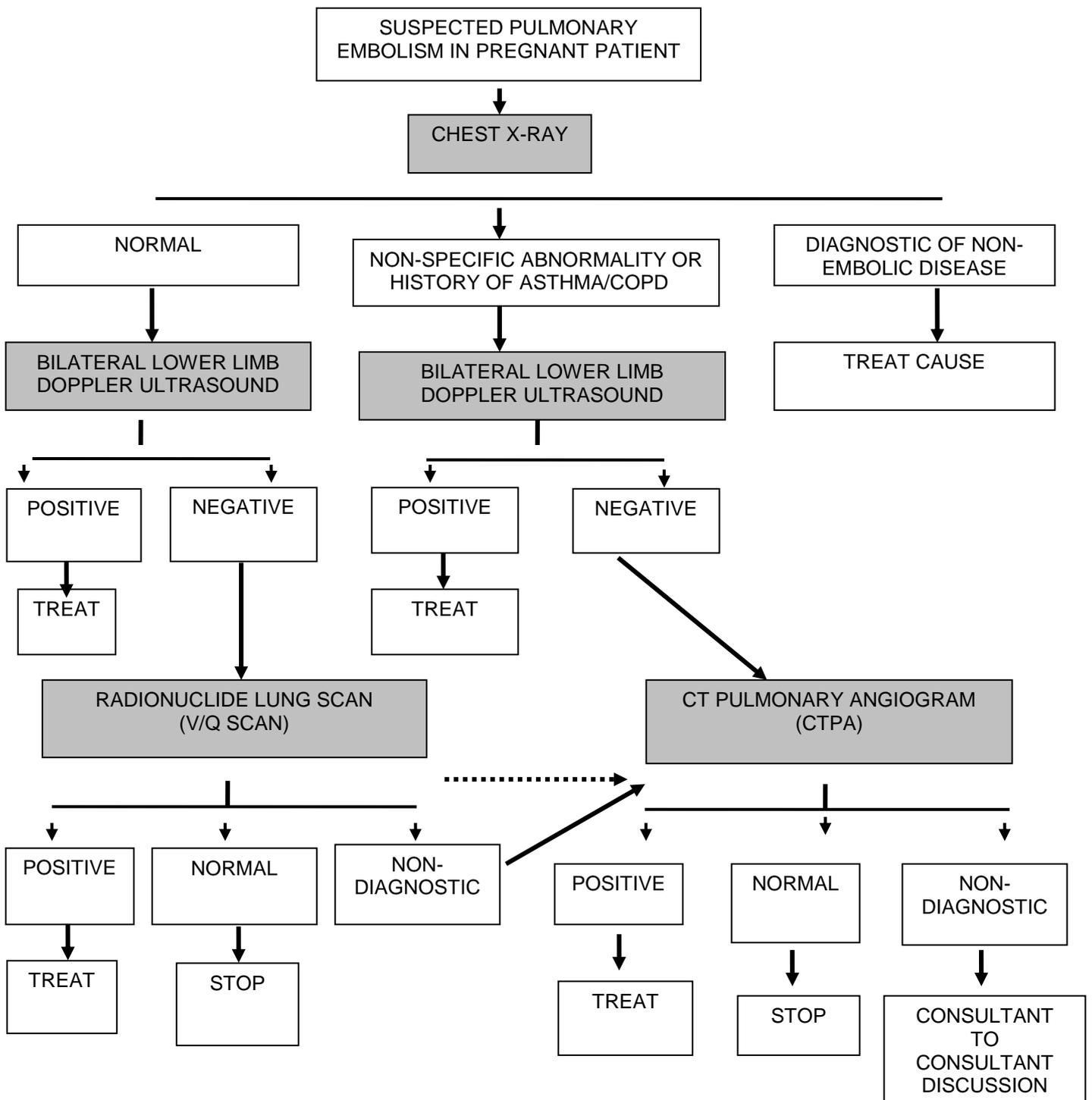
Prior to discharge any case of confirmed VTE must be referred to coagulation clinic (haematology dept.) for appropriate follow-up according to documented care plan.

8. Record keeping and documentation

An individualised management plan must be documented within the patient health record for all women who require thromboprophylaxis or treatment for a diagnosis of DVT or PE. It is expected that every episode of care be recorded clearly, in chronological order and as contemporaneously as possible by all healthcare professionals as per Hospital Trust Policy. This is in keeping with standards set by professional colleges, i.e. NMC and RCOG. All entries must have the **date and time** together with **signature and printed name**

Appendix 1

Imaging algorithm for the investigation of suspected Pulmonary Embolism (PE) in pregnancy



Notes:

- All patients should have CXR (to identify alternative diagnosis) followed by senior doctor review prior to requesting further imaging.
- Between 9am-4pm (Mon-Fri) initiate the imaging sequence using a single request form (stating “suspected PE in pregnancy: for imaging pathway: bilateral leg USS +/- proceed to VQ-SPECT or CTPA”); the radiologist will arrange the next imaging step if USS normal.
- Complete the “suspected PE in pregnancy” proforma, to accompany imaging request.
- If patient in extremis, consider ECHO if expertise available, otherwise consider urgent CTPA.
- If V/Q scan is unavailable and urgent investigation required, consider CTPA.
- V/Q will be available 9am to 5pm Monday to Friday.
- Doppler ultrasound requested via ultrasound room 8 (X-ray West) between 9am and 5pm and via on-call Radiology SpR 5pm to 8pm.



Surname: First Name: Hospital Number: NHS Number:
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Risk assessment for venous thromboembolism (VTE)

Please complete at booking, any antenatal admission, before theatre, after theatre and again at 72 hours if still an inpatient.

Date and Time	Risk Category	Actions Required	Print name & Signature
	If total score ≥ 4 antenatally, consider thromboprophylaxis from the first trimester.		
	If total score 3 antenatally, consider thromboprophylaxis from 28 weeks		
	If total score ≥ 2 postnatally, consider thromboprophylaxis for at least 10 days.		
	If admitted to hospital antenatally consider thromboprophylaxis		
	If prolonged admission (≥ 3 days) or readmission to hospital within the puerperium consider thromboprophylaxis.		

NB For patients with an identified bleeding risk, the balance of risk of bleeding and thrombosis should be discussed in consultation with a haematologist with expertise in thrombosis and bleeding in pregnancy

Date and Time	Risk Category	Actions Required	Print name & Signature
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Form Filed: Obstetrics

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Risk assessment for venous Thromboembolism (VTE)

Risk Factors for VTE

Pre-existing/Antenatal risk factors	Tick	Score
Previous VTE (NOT related to major surgery)		4
Previous VTE related to major surgery		3
Known high-risk thrombophilia		3
Medical comorbidities e.g. cancer, heart failure; active systemic lupus erythematosus, inflammatory polyarthropathy or inflammatory bowel disease; nephrotic syndrome; type 1 diabetes mellitus with nephropathy; sickle cell disease; current intravenous drug user		3
Family history of unprovoked or oestrogen-related VTE in first-degree relative		1
Known low-risk thrombophilia (no VTE)		1a
Age(>35 years)		1
Obesity		1 or 2b
Parity ≥3		1
Smoker		1
Gross varicose veins		1
Obstetric risk factors		
Pre-eclampsia in current pregnancy		1
ART/IVF (antenatal only)		1
Multiple pregnancy		1
Transient risk factors (eg during an admission)		
Any surgical procedure in pregnancy or puerperium except immediate repair of the perineum, e.g. appendectomy, postpartum sterilisation		3
Hyperemesis		3
OHSS (first trimester only)		4
Current systemic infection		1
Immobility, dehydration		1
Postnatal risk factors (Also complete all boxes above)		
Caesarean section in labour		2
Elective caesarean section		1
Mid-cavity or rotational operative delivery		1
Prolonged labour (>24 hours)		1
PPH (> 1 litre or transfusion)		1
Preterm birth <37 ⁺ weeks		1
Stillbirth		1
TOTAL SCORE		

Abbreviations: ART assisted reproductive technology; IVF in vitro fertilisation; OHSS ovarian hyperstimulation syndrome; VTE venous thromboembolism. PPH postpartum haemorrhage

a. If the known low-risk thrombophilia is in a women with a family history of VTE in a first-degree relative postpartum thromboprophylaxis should be continued for 6 weeks.



Monitoring and Audit

Auditable standards:

- Have appropriate risk assessments been carried out?
- Have appropriate actions been taken in response to risk factors?
- Appropriate thromboprophylaxis during pregnancy?
- Appropriate thromboprophylaxis during postnatal period?

Please refer to audit tool, location: 'Maternity on cl2-file11', Guidelines

Reports to:

Clinical Effectiveness Committee – responsible for action plan and implementation of recommendations from audit

Clinical Governance & Risk Management Committee

Frequency of audit:

Annual

Responsible person:

Obstetrician

References

Lewis G (Ed) 2007. The Confidential Enquiry into Maternal and Child Health (CEMACH). Saving Mothers' Lives: reviewing maternal deaths to make motherhood safer – 2003-2005. **The Seventh Report on Confidential Enquiries into Maternal deaths in the United Kingdom.** London: CEMACH

National Institute for Health and Clinical Excellence 2010. **Venous thromboembolism: reducing the risk.** London, UK

Royal College of Obstetricians and Gynaecologists (RCOG) 2004. Guideline 37. **Thromboprophylaxis during pregnancy, labour and after vaginal delivery.** RCOG, London.

Royal College of Obstetricians and Gynaecologists (RCOG) 2007. Guideline 28. **Thromboembolic disease in pregnancy and the puerperium: Acute management.** RCOG, London.

Cross references

Antenatal Guideline 32 – Obesity in pregnancy, labour and puerperium.

Antenatal Guideline 44 – Guideline development within Maternity Services.

Intrapartum care guideline No 2, Admission criteria for critical care room (CDS)

Clinical Records Keeping Policy – Derriford Hospital

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Changes	New AN and PN VTE assessment forms Removal of HIT monitoring form Treatment flowchart		
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