REF: CTMObs 130

Bwrdd Iechyd Prifysgol Cwm Taf Morgannwg University Health Board

Venous Thrombo Embolism (VTE)
Risk Assessment, Prophylaxis, and Treatment in Pregnancy and Puerperium

Initiated By	Cwm Taf Morgannwg University Health Board Obstetrics and Gynaecology Directorate
Approval Group	Integrated Business, Obstetrics, Gynaecology, Sexual Health & Quality And Safety Group
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CHANGE HISTORY

Version	Date	Author Job Title	Reasoning
1.0	January 2024	Miss Tehmina Riaz Speciality Doctor	New CTMUHB Guideline (replaces previous CTUHB and ABMUHB guidance)

AUTHORSHIP, RESPONSIBILITY AND REVIEW

Author	Miss Tehmina Riaz	Ratification Date	February 2024
Job Title	Speciality Doctor	Review Date	Three years from date of approval or earlier if national guidelines change
Service Group	Children and Families	Clinical Director	Mr Mohamed Elnasharty
Service Lead		Directorate Manager	

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BACKGROUND

Guideline Definition

Clinical guidelines are systemically developed statements that assist clinicians and patients in making decisions about appropriate treatments for specific conditions.

They allow deviation from a prescribed pathway according to the individual circumstances and where reasons can be clearly demonstrated and documented.

Introduction

Thrombosis and thromboembolism remains the leading direct cause of maternal death at a rate of 1.4 per 100,000 maternities[1]. Maternal morbidity rates are higher and also include deep vein thrombosis (DVT)[2].

Purpose: This guideline outlines risk assessment and prophylaxis for pregnant and post-partum women at risk of VTE, as well as acute management once a VTE event occurs.

Scope: This policy applies to all women who are currently pregnant and those who have delivered recently (within three months post-delivery).

Roles and Responsibilities:

In seeking further advice on any uncertainties contained in this document, or if you feel that there is new or more updated advice it is your responsibility to contact the guideline author or Approval Group manager so that any amendments can be made.

The guideline Approval Group is responsible for disseminating this guideline to all appropriate staff.

The guideline author or a named alternative is responsible for updating the guideline with any amendments that they become aware of or are highlighted to them.

All health professionals are responsible to ensure that the guideline is utilised effectively, and to ensure that they are competent and compassionate in the implementation of it.

Training Requirements

There is a need for all new staff in Obstetrics and Gynaecology (Midwifery and Medical Staff) to be provided with an update at induction.

Monitoring of Compliance

- By audit of risk assessment and prescribing of thrombo-prophylaxis.
- All HAT events are monitored by the Anti-Coagulation Committee and lessons learnt.
- The Governance Department will collate any complaints and distribute to the relevant individuals for comments, and share any learning points.
- The Service Lead will oversee any governance issues, make relevant recommendations to the directorate, and advise the Clinical Director or the directorate of any matters that require implementation.
- The Health Board reserves the right, without notice, to amend any monitoring requirements in order to meet any statutory obligations or the needs of the organisation

Risk Assessment:

All women should have a documented risk assessment using the CTMUHB Maternity VTE risk assessment tool (Appendix 1) as early in pregnancy as possible. This replaces the All Wales Hand-held notes assessment on page 10 and should be stapled onto page 10. The numerical score dictates the need for thromboprophylaxis. See flow-chart 1 below for management of midwifery-led and consultant led care. Women also need a fresh Risk Assessment on each admission to hospital and after delivery.

Where a need for thromboprophylaxis is identified, this should be discussed with the woman, and if she consents to the treatment, this should be prescribed on the outpatient prescription form (Appendix 2). This will allow pharmacy to dispense for the remainder of the pregnancy and puerperium. Women can be shown how to administer Low Molecular Weight Heparin (LMWH) through the Antenatal Clinic and Day Assessment Unit (ADAU). It also important to recognise that LMWH is porcine in origin (derived from pigs) and this may be relevant for certain women for

dietary or religious beliefs.

Flow Chart 1 Maternity Risk Assessment for Antenatal Venous Thromboembolism

VTE risk assessment to be completed at **booking by Community Midwife**

VTE score checked following dating scan.

Score of 1 Discuss the need for maintenance of hydration/mobility and vigilance in reporting symptoms and provide a printed copy of RCOG leaflet (Appendix 3) and document in notes

Midwifery Led Clinic (MLC)	Consultant Led Clinic (MLC)
If total score = 2, book into ADAU at 36 weeks for LMWH prescription for 10 days post natal prophylaxis and collection of sharps disposal box. **Midwives to discuss with** ANC Con/SAS/STr to review notes and prescribe if appropriate If total score ≥ 3, full discussion held around antenatal thromboprophylaxis. If recommended prophylaxis agreed, transfer to CLC. Labour Ward is the recommended place of birth for women on antenatal thromboprophylaxis due to small increased risk of PPH.	If total score = 2, Consultant/SAS/STr to document in special considerations in hand-held notes the need of Postnatal thromboprophylaxis. If total score = 3, arrange ANC at 26 weeks to consider thromboprophylaxis from 28 weeks. If total score = 4, midwife to book in the next ANC to consider thrombo-prophylaxis from first trimester. Labour ward is the recommended birth setting due to small increased chance of PPH.

- Information regarding the collection of prescription to be given to the woman.
- Advise women to take LMWH to birth area when attending in labour.
- Midwife responsible for the birth to demonstrate administration prior to discharge.

NEW ADMISSION TO Antenatal Ward/Delivery Suite

- Risk Assess VTE form and follow key on chart. Appendix 1
  - If score ≥2 Obstetrician to consider LMWH
- ***RCOG recommends to consider LMWH for all admissions in antenatal period***
- ***Review intended place of birth in light of VTE thromo-prophylaxis***

Pre-Pregnancy Counselling

Women who have had a previous VTE should have pre-pregnancy counselling and plan for thromboprophylaxis during pregnancy made. Refer women in PCH/RGH to Mrs Helen Marx, to Mr Pembridge in YCR and to Mrs Liza Mukhopadhyay in the POWH.

Women on oral anti-coagulants pre-pregnancy need to be switched onto LMWH as early as possible by the GP and referred to the local Medical antenatal clinic.

Over two thirds of lethal VTE events were in women who were overweight or obese. Measures to manage weight should be explored at each opportunity.

Combined care with Haematology

Refer to haematology for advice in complex cases e.g. previous or recurrent VTE, allergy to LMWH, thrombophilia, etc. For POW and NPTH women, take advice from the on-call Haematology for Swansea Bay through switch-board or email Dr Ann Benton. For PCH/RGH contact Haematology Consultants Dr Hanadi

Ezminga or Dr Waleed Bashi for advice.

Early pregnancy admissions

Women admitted in early pregnancy on gynaecology wards, medical and surgical wards need to be assessed in the same manner. Sometimes the gestation is too early for booking measurements of BMI and this should be done at admission to determine risk score and dose of thrombo-prophylaxis. Women with hyperemesis are at a higher risk and women undergoing surgical management of miscarriage or ectopic pregnancy require at least 10 days of thrombo-prophylaxis, unless contra-indicated.

Admission during antenatal period

Risk assess at admission

Admitting midwife and physician to check VTE risk and consider prophylaxis, unless contra-indicated. Consultant ward round in the morning to double-check need for prophylaxis and risk assessment form in notes.

Spontaneous labour

Women who are suspected to be in labour and who are on prophylactic or therapeutic dose of LMWH are advised to avoid the next injection and inform labour ward. A plan of care regarding withholding of LMWH should be in patient's notes prior to an elective procedures and made in conjunction with Obstetrician and Anaesthetist. Dehydration should be avoided especially in labour - special attention to hydration should be given to women in prolonged labour.

Induction of labour

Most women will discontinue their LMWH on the day of admission unless written instructions by a consultant state otherwise. All women who had antenatal LMWH should have thromboembolic stockings applied, and be advised on the importance of hydration and mobilisation. If the VTE score is 4 or more, then an individual plan should be made after the initial assessment of cervical favourability, to determine if further doses of LMWH should be administered during the induction of labour process. This should balance the risk of needing regional anaesthesia against the risk of VTE.

Epidural/Spinal See Table 1 below for recommendation

Table 1 Recommended time intervals before & after neuroaxial block and catheter removal

Enoxaparin	Acceptable time *before* Puncture/catheter placement	Acceptable time for next dose *after* Puncture/catheter removal
Prophylactic dose	12 hours	4 hours
Therapeutic dose	24 hours	4 hours Delay 24 hours after traumatic placement

Postnatal

All women should have a further assessment following delivery on a fresh form (see appendix 1). It is recommended that women be re-weighed after delivery and if the weight has increased more than 12 kg, this should be taken to calculate dose of LMWH and not the booking weight. Risk assessment after delivery should be done prior to transfer to the ward by the midwife or doctor who performed the delivery, preferably within 4 hours of delivery. All births taking place in the birth centre and home births need to be risk assessed.

Special care should be taken in advising LMWH to vulnerable women especially women with a psychiatric illness who may default self-administration.

Special issues of affecting thromboprophylaxis

a. Accurate dosage:

Dose of prophylactic LMWH is dependent on maternal weight: if there has been an increase of more than 12 kg weight in pregnancy the dose may need to be increased e.g. if at booking a woman has a weight of 82 kg. the correct dose prescribed is Enoxaparin 40 mg per day - however if her weight at 36 weeks is 101 kg. the dose increases to 60 mg per day. Treatment dose of LMWH is calculated according to current maternal weight. See back of Appendix 1 for dosage according to weight. The LMWH used in CTMUHB is enoxaparin . Discuss patients with LMWH allergy with consultant haematologist with expertise in haemostasis and pregnancy.

b. Responsibilities of staff :

After any procedure in theatre, it is the responsibility of the team (Anaesthetist/Obstetrician /Midwife) to discuss need for thrombo-prophylaxis, prescribe the appropriate dose and duration, document the time of first dose to be given on the drug chart before the woman leaves the theatre. The first prophylactic dose of LMWH should be given within 4 hours of delivery provided there are no obstetric concerns regarding postpartum haemorrhage and regional analgesia has not been used. If regional analgesia or anaesthesia has been used, then it is the responsibility of the anaesthetist to document time of first dose of LMWH – it is recommended the first dose should be administered 4 hours after removing the epidural catheter or spinal needle. The hospital pharmacist ensures the correct weight, appropriate dose and duration is dispensed.

Acute Venous Thrombotic Event

Most pregnant women with a VTE will have clinical symptoms. These include unilateral leg pain, redness and swelling (DVT) lower abdominal pain (pelvic vessel thrombus), groin pain, dyspnoea, chest pain, haemoptysis, and collapse (PE). Signs include tachypnoea, tachycardia, low grade pyrexia, and a discrepancy in the diameter of the lower limbs by 3 cm. or more. DVT is more likely to be on the left side than the right due to compression from the uterus on the iliac vessels. Women are reviewed promptly by the medical team in A&E or AMU. However, if these areas are busy and obstetric patients can be reviewed promptly in obstetric areas, clinical judgement of experienced obstetricians may be more expeditious to initiate relevant investigations and treatment.

Investigation and Management:

In any woman suspected of having a VTE, treatment dose of LMWH should be given until the diagnosis has been excluded. This can be with enoxaparin 1mg/kg bd or tinzaparin 175units/kg daily (based on booking weight unless an increase of more than 12kg has occurred).

All women should have a full blood count (FBC), coagulation screen, urea and electrolytes (U&Es) and liver function tests (LFTs) taken. D-dimers are not useful in pregnant women as pregnancy elevates the results. Likewise, the WELLS score has not been validated as a screening tool for pregnant women, and its use is therefore not advised. Pregnancy-adapted YEARS algorithm has been found in one study to safely rule out PE and avoid CTPA but has not been validated for use universally[9].

For suspicion of DVT, a compression Doppler ultrasound of the affected leg should be undertaken. If this is negative for a DVT and the clinical suspicion of DVT is low, then LMWH can then be stopped. However, if clinical suspicion is high then treatment should be continued, and further imaging should be discussed with the radiologists. This may include a repeat Doppler scan after 3 and 7 days, contrast venography or MRI venography. Women with groin pain should have full leg and pelvis scanned to exclude ilio-femoral thrombus.

For suspicion of PE in a clinically stable patient, a chest X-ray, 12 lead ECG and arterial blood gas should also be undertaken. ECG abnormalities suggestive of a PE include T wave inversion, S1Q3T3 pattern, and right bundle branch block. CXR may show other pathologies such as pneumonia, which may affect the suitability of further imaging. If there are signs or symptoms of DVT then initial investigation is a Doppler lower limb, and if positive then treat as a PE. If there is no clinical indication of a DVT, then the definitive investigation is either a Computerised Tomography Pulmonary Angiogram (CTPA) or Ventilation Perfusion (VQ) scan. Women need to be informed that with both imaging techniques the radiation exposure will slightly increase (1 in 170,000) the risk of childhood cancers in the infant (more so with VQ than CTPA) and breast cancer in the mother (more so with CTPA than VQ). A consent form needs to be signed by the patient before sending for imaging (Appendix 4 can be downloaded from the intranet).

For suspicion of PE, in a clinically unstable patient, care must be undertaken by a multidisciplinary team including consultant obstetrician, consultant anaesthetist, physicians and radiologists, in an appropriate area such as labour ward or HDU, and follow the principles of ABC resuscitation. Investigations ideally should be as for clinically stable patients but with a portable echo (which may show right ventricular dysfunction) or CTPA.

The obstetric team should see pregnant women with chest pain in conjunction with the medical team. In the last confidential enquiries, some women were referred for assessment to the medical team who were unaware of or underestimated the risk of embolism in pregnancy[2].

Pregnant and postpartum women presenting to the Emergency Department with medical problems should be discussed with a member of the maternity medical team. This should ensure appropriate investigation and treatment of pulmonary embolism is not withheld and prophylaxis is prescribed where appropriate[1].

Treatment of DVT and stable PE

LMWH can be given once daily or divided doses with dosage titrated against the woman's booking or recent weight. See Table 2 below for recommended dosages. Women will usually be seen in A&E and/or in ambulatory care and treatment regime prescribed by the medical team with follow-up in

obstetric and medical team, as appropriate.

Table 2 Initial dose of therapeutic enoxaparin is determined as follows:

Booking / early pregnancy weight	Initial enoxaparin dose (subcutaneous)
< 50 kg	40 mg twice daily or 60 mg once daily
50–69 kg	60 mg twice daily or 90 mg once daily
70–89 kg	80 mg twice daily or 120 mg once daily
90–109 kg	100 mg twice daily or 150 mg once daily
110–125 kg	120 mg twice daily or 180 mg once daily
> 125 kg	Discuss with haematologist

Treatment of Unstable PE

Treatment with IV unfractionated heparin is preferable to LMWH for its quicker response. One regime is to give a loading dose of 80 units/kg followed by an infusion of 18 units/kg/hour. Monitoring of the APTT will be required where IV heparin is administered. If there is haemodynamic compromise, then thrombolytic therapy may be given followed by IV heparin infusion (omitting the loading dose). The health board IV heparin prescription chart should be used link: http://ctuhb-intranet/dir/MM/AntiCoag/Procedures%20Policies%20and%20Charts/Heparin%20infusion%20chart.pdf

In cases of life threatening PE, a team of experienced clinicians, including the on-call consultant obstetrician, should decide on an individual basis whether the woman receives intravenous unfractionated heparin, thrombolytic therapy or thoracotomy and surgical embolectomy. The on-call medical team should be contacted immediately. An urgent portable echocardiogram or CTPA within one hour of presentation should be arranged. Management should involve a multidisciplinary resuscitation team including senior physicians, obstetricians, haematologist, vascular surgeon, anaesthetist and radiologist. Neither pregnancy, caesarean section delivery or the immediate postpartum state are absolute contraindications to thrombolysis.

Following acute-phase management with LMWH, some form of thrombo-prophylaxis must be continued for the rest of the pregnancy and the puerperium. Advice from the haematologist and physician should be taken. Arrangements should be made with the haematology department for outpatient follow-up and advice with assessment of blood platelets and peak anti-Xa levels, if appropriate. The aim is to achieve a peak anti-Xa 3 hours post-injection of 0.5 – 1.2 units/ml. A plan on management of anticoagulation for these women during induction of labour, spontaneous labour, or elective surgery, should be made in conjunction with haematology.

Post-partum therapeutic dose is continued for 6 weeks but occasionally for 3 months in total, and can be switched to Warfarin after the fifth postnatal day. Both LMWH and warfarin are safe in breast-feeding. Liaison with the VTE service is advised for women wishing to start oral therapy. Women should ensure they have effective contraception if commencing warfarin due to its teratogenic effects.

References:

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2. Marian Knight, Amanda Bellis, Arlene Wise, Sebastian Lucas and Catherine Nelson-Piercy on behalf of the MBRRACE-UK thromboembolism chapter-writing group. 6. Messages for the prevention and treatment of thromboembolism In Knight M, Bunch K, Tuffnell D, Patel R, Shakespeare J, Kotnis R, Kenyon S, Kurinczuk JJ (Eds.) on behalf of MBRRACE-UK. Saving Lives, Improving Mothers' Care – Lessons learned to inform maternity care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2017-19. Oxford: National Perinatal Epidemiology Unit, University of Oxford 2021: p64-72.
3. Reducing the Risk of Venous Thromboembolism during Pregnancy and Puerperium. Royal College of Obstetricians & Gynaecologists. Green-top Guideline No. 37a April 2015
4. https://www.rcog.org.uk/globalassets/documents/patients/patient-information-leaflets/pregnancy/pi-reducing-the-risk-of-vt-in-pregnancy.pdf 6 pages please print on both sides
5. Thromboembolic Disease in Pregnancy and the Puerperium: Acute Management Royal College of Obstetricians and Gynaecologist Green-top Guideline No. 37b April 2015

6. CG92 Reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in patients admitted to hospital Chapter 30 Pregnancy and up to 6 weeks post partum pg 427 – 438 NICE Guideline Jan 2010
7. Caesarean section NICE clinical guideline 13 2004
8. http://howis.wales.nhs.uk/sites3/Documents/926/CID1182SBUHBHeparinInfusionPrescriptionChartNovember2020.
9. Van der Pol L.M., Tromeur C., Bistervels I.M., Ainle F.N., Van Bemmel T., Bertoletti L., et. al.: Pregnancy-adapted YEARS algorithm for diagnosis of suspected pulmonary embolism. N Engl J Med 2019; 380: pp. 1139-1149

Appendix 1 Maternity VTE Risk Assessment Form

Addressograph

GIG CYMRU NHS WALES
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Maternity Risk Assessment for Venous Thromboembolism (VTE)

Pre-existing risk factors for VTE	Tick	Score
Previous VTE *(except a single event related to major surgery)* ***Refer to Consultant Obstetrician at diagnosis of current pregnancy***		4
Previous VTE provoked by major surgery		3
Known high-risk thrombophilia *(Antithrombin deficiency, APLS, Homozygous factor V Leiden)*		3
Medical co morbidities *e.g. cancer, heart failure; active SLE, inflammatory polyarthropathy or inflammatory bowel disease; nephrotic syndrome; type I diabetes mellitus with nephropathy; sickle cell disease; current intravenous drug user*		3
Family history of unprovoked or estrogen-related VTE in first-degree relative		1
Known low-risk thrombophilia *(Heterozygous factor V Leiden, Prothrombin gene mutation)*		1
Age *(> 35 years)*		1
Obesity **BMI kg/m²** *≥ 30 = 1; ≥ 40 = 2; ≥ 50 = 3*		1 / 2 / 3
Parity ≥ 3		1
Smoker		1
Gross varicose veins		1
Obstetric risk factors in current pregnancy	**Tick**	**Score**
Pre-eclampsia in current pregnancy		1
ART/IVF *(antenatal only)*		1
Multiple pregnancy		1
Transient risk factors in current pregnancy	**Tick**	**Score**
Any surgical procedure in pregnancy or puerperium *except immediate repair of the perineum e.g. appendicectomy*		3
Hyperemesis/ Dehydration		3
Ovarian Hyper Stimulation Syndrome *(first trimester only)*		4
Current systemic infection		1
Immobility *(PGP)*		1
If admitted to hospital during antenatal period, consider thromboprophylaxis.		
Postnatal risk factors	**Tick**	**Score**
Caesarean section – *elective score 1, in labour score 2*		1 / 2
Mid-cavity or rotational operative delivery		1
Prolonged labour *(> 24 hours)*		1
PPH *(> 1 litre or transfusion)*		1
Preterm birth < 37+0 weeks in current pregnancy		1
Stillbirth in current pregnancy		1
If prolonged admission (≥ 3 days) or readmission to hospital within the puerperium, consider thromboprophylaxis.		
Total VTE Risk Score		

Thromboprophylaxis needed?	**Duration**	**Prescribed?**
❑ No ❑ LMWH ❑ TEDS	Antenatal ❑ From first trimester ❑ From 28 weeks Postnatal ❑ 10 days ❑ 6 weeks	❑ Yes ❑ No

Date of Risk Assessment:	**Name:**	**Designation:**
_____	_____	_____

- **If total score ≥ 4 antenatal, consider thromboprophylaxis from first trimester and 6 weeks post natal**
- **If total score 3 antenatal, consider thromboprophylaxis from 28 weeks and 6 weeks post natal**
- **If total score ≥ 2 postnatal, consider thromboprophylaxis for at least 10 days postnatal and during any hospital admission**
- **If total score ≥ 3 postnatal. consider thromboprophylaxis for 6 weeks**

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

Thrombo-prophylactic doses for antenatal and postnatal LMWH: Table 3

Prescribe according to booking weight unless there has been a significant weight gain (>12 kg) during pregnancy. Lower doses of LMWH should be employed if the creatinine clearance is less than 30 ml/minute with enoxaparin or less than 20 ml/minute with tinzaparin.

Table 3: Suggested prophylactic doses of LMWH in pregnancy

WEIGHT (KG)	ENOXAPARIN	TINZAPARIN
< 50	20 mg daily	3500 units daily
50 - 90	40 mg daily	4500 units daily
91 - 130	60 mg daily*	7000 units daily*
131 - 170	80 mg daily*	9000 units daily*
>170	0.6 mg/kg/day*	75 units/kg/day*
HIGH PROPHYLACTIC DOSE FOR WOMEN WEIGHING 50 – 90 KG	40 mg 12 hourly	4500 units 12 hourly

* Can be prescribed in divided dose twice a day
* Single daily dose advised in women with needle-phobia, and/or if administered by community midwife.

Contraindications/cautions to LMWH use

- Allergy to LMWH – discuss with Haematology for alternatives
- Known bleeding disorder (e.g. haemophilia, von Willebrand's disease or acquired coagulopathy)
- Active antenatal or postpartum bleeding
- Women considered at increased risk of major haemorrhage (e.g. placenta praevia)
- Thrombocytopenia (platelet count < 75×10^9/l)
- Acute stroke in previous 4 weeks (haemorrhagic or ischaemic)
- Severe renal disease (glomerular filtration rate [GFR] < 30 ml/minute/1.73 m^2)
- Severe liver disease (prothrombin time above normal range or known varices)
- Uncontrolled hypertension (blood pressure > 200 mmHg systolic or > 120 mmHg diastolic)

Consider below knee anti-embolic stockings alone if LMWH is contraindicated and thromboprophylaxis needed.

Avoid stockings if pedal pulses are impalpable, peripheral vascular disease, severe dermatitis, peripheral neuropathy or recent skin graft.

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University Health Board

Addressograph

Record of Antenatal Reassessment of VTE Risk Score

The VTE Risk Score should be reassessed, documented, and management plan reviewed at each antenatal contact.

Date:		**VTE Risk Score:**	
Plan:		**Signature:**	
Date:		**VTE Risk Score:**	
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Bwrdd Iechyd Prifysgol Cwm Taf Morgannwg University Health Board

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Plan:		**Signature:**	

Appendix 2 Example of hospital prescription for Antenatal Thrombo-prophylaxis used in POWH
The prescription form may be different in different hospitals.

IP6990(K)CT

PHARMACY COPY

PLEASE TAKE THIS PRESCRIPTION TO THE HOSPITAL PHARMACY

SURNAME: X Y

FORENAMES: X Y

ADDRESS: X Y

D.O.B.: X Y

CASE No: X

WEIGHT: 85 kg

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PRINCESS OF WALES HOSPITAL

Tel: (01656) 752752

GP:

ADDRESS:

CONSULTANT X X

CLINIC ANC

DIRECTORATE W X X

FOR REFERRAL ONLY ☐ FOR DISPENSING ☐ PHARMACY USE ONLY

1	INHIXA (ENOXAPARIN) 40mg S/C daily	
	Special Instructions to continue throughout pregnancy and 6 weeks post delivery	
2		
	Special Instructions	
3		
	Special Instructions	
4		
	Special Instructions	
5		
	Special Instructions	
6		
	Special Instructions	
DOCTOR'S SIGNATURE		DATE 27/3/23
PHARMACIST'S SIGNATURE		DATE

I have examined your patient today and my preliminary diagnosis is .....

VTE Risk Score (3) at 28/40 Pregnancy

Further investigations are/~~are not~~ being arranged

I have initiated therapy as above

There is a need/ no need for the patient to be reviewed by ~~me~~/GP in ..... weeks time

A further appointment ~~has~~/has not been arranged

Meanwhile I would recommend your patient continues on items numbered ..1..

Appendix 3 RCOG PIL

Health & care information you can trust

Royal College of Obstetricians & Gynaecologists

Information for you

Published in August 2015

Reducing the risk of venous thrombosis in pregnancy and after birth

Who is this information for?

This information is about reducing the risk of a venous thrombosis if you are thinking about having a baby, are already pregnant or have just had a baby.

If you need information on the diagnosis and treatment of venous thrombosis during pregnancy or after birth, please see the RCOG patient information *Diagnosis and treatment of venous thrombosis in pregnancy and after birth* (www.rcog.org.uk/en/patients/patient-leaflets/treatment-of-venous-thrombosis-in-pregnancy-and-after-birth).

What is venous thrombosis?

A thrombosis is a blood clot in a blood vessel (a vein or an artery). Venous thrombosis occurs in a vein. Veins are the blood vessels that take blood back to the heart and lungs whereas arteries take the blood away.

A deep vein thrombosis (DVT) is a blood clot that forms in a deep vein of the leg, calf or pelvis.

How common is it in pregnancy?

Pregnancy increases your risk of a DVT, with the highest risk being just after you have had your baby. However, venous thrombosis is still uncommon in pregnancy or in the first 6 weeks after birth, occurring in only 1–2 in 1000 women.

A DVT can occur at any time during your pregnancy, including the first 3 months, so it is important to see your midwife early in pregnancy.

Why is a DVT serious?

Venous thrombosis can be serious because the blood clot may break off and travel in the bloodstream until it gets lodged in another part of the body, such

as the lung. This is called a pulmonary embolism (PE) and can be life threatening. However, dying from a PE is very rare in women who are pregnant or who have just had a baby.

The symptoms of a PE can include:

- sudden unexplained difficulty in breathing
- tightness in the chest or chest pain
- coughing up blood (haemoptysis)
- feeling very unwell or collapsing

You should seek help immediately if you experience any of these symptoms. Diagnosing and treating a DVT reduces the risk of developing a PE.

What increases my risk of DVT or PE?

Your risk of venous thrombosis is increased further if any of the following apply to you.

- **Before pregnancy**
  If you:
  - are over 35 years of age
  - have already had three or more babies
  - have had a previous venous thrombosis
  - have a mother, father, brother or sister who has had a venous thrombosis
  - have a thrombophilia (a condition that makes a blood clot more likely)
  - have a medical condition such as heart disease, lung disease or arthritis – your doctor or midwife will be able to tell you whether any medical condition you have increases your risk of a DVT/PE
  - have severe varicose veins that are painful or above the knee with redness/swelling
  - are a wheelchair user.
- **Lifestyle**
  If you:
  - are overweight with a body mass index (BMI) over 30, are a smoker or if you use intravenous drugs.
- **During pregnancy**
  If you:
  - are admitted to hospital
  - are carrying more than one baby (multiple pregnancy)
  - become dehydrated or less mobile in pregnancy due to, for example, vomiting in early pregnancy, being in hospital with a severe infection such as appendicitis or a kidney infection or if you are unwell from fertility treatment (ovarian hyperstimulation syndrome)
  - are immobile for long periods of time, for example after an operation or when travelling for 4 hours or longer (by air, car or train)
  - have pre-eclampsia – please see RCOG patient information *Pre-eclampsia* (www.rcog.org.uk/en/patients/patient-leaflets/pre-eclampsia).
- **After the birth of your baby**
  If you:
  - have a very long labour (more than 24 hours) or have had a caesarean section, lose a lot of blood after you have had your baby or receive a blood transfusion.

Can I reduce the risk of getting a DVT or PE?

You may be able to reduce your risk, as most DVTs and PEs that occur during pregnancy and after birth are preventable.

You will have a risk assessment during pregnancy and after you have had your baby, during which your doctor or midwife will ask whether you have any of the risk factors above. This helps to decide whether you would benefit from preventive treatment. This will depend on which risk factors you have and how many.

Some risk factors, such as previous thrombosis, are significant enough on their own for treatment to be recommended. Other risk factors may not be enough on their own for you to require treatment. Your doctor or midwife will talk with you about your risk factors and explain why treatment may be advised in your case.

If you are diagnosed with a DVT, your doctor will give you treatment to reduce the risk of a PE occurring.

When will my risk be assessed?

Before pregnancy

If you have any of the risk factors listed above and are planning a pregnancy you should talk to your GP or midwife. You may need to see an obstetrician early in pregnancy to discuss starting treatment.

If you have previously had a DVT or PE or have a thrombophilia (see above), your GP can arrange a hospital appointment with a doctor who specialises in thrombosis in pregnancy.

If you are already taking warfarin to treat or prevent venous thrombosis, you may be advised to change to heparin injections because warfarin can be harmful to your unborn baby (see section below). Most women are advised to change before becoming pregnant or as early as possible in pregnancy. For some women, warfarin may be the only option. Talk to your doctor before you become pregnant so that any changes can be planned to keep you and your baby as healthy as possible.

During and after pregnancy

Your midwife should carry out a risk assessment at your first antenatal booking and at around 28 weeks of pregnancy. A risk assessment should also be carried out if your situation changes during your pregnancy and/or if you are admitted to hospital. After your baby is born a further risk assessment should be done.

Can my risk change?

Yes. Your risk can either increase or decrease.

You may start by having one or two risk factors but your risk can increase if you develop other factors, such as becoming unwell, developing severe varicose veins, travelling for over 4 hours or having a complicated birth. In this case, you may be advised to start taking treatment.

Your risk may also decrease, for example if you stop smoking. Treatment may then no longer be necessary.

How can I reduce my risk of getting a DVT or PE?

You can reduce your risk of getting of a DVT or PE:

- stay as active as you can
- wear special stockings (graduated elastic compression stockings) to help prevent blood clots
- keep hydrated by drinking normal amounts of fluids

- stop smoking
- lose weight before pregnancy if you are overweight.

You may be advised to start treatment with injections of heparin, which is an anticoagulant used to thin the blood. There are various types of heparin. The most commonly used in pregnancy is low-molecular-weight heparin (LMWH). Heparin is also used to treat venous thrombosis, but the dose of heparin used to prevent a venous thrombosis is usually less.

For most women, the benefits of heparin are that it reduces the risk of a venous thrombosis or a PE developing.

What does heparin treatment involve?

Heparin is given as an injection under the skin (subcutaneous) at the same time every day (sometimes twice daily). The dose is worked out for you depending on your risk factors and your weight in early pregnancy or before you became pregnant.

You may be on a low-dose or a high-dose regimen. You (or a family member) will be shown how and where in your body to give the injections. You will be provided with the needles and syringes (already made up) and will be given advice on how to store and dispose of these.

Are there any risks to my baby and me from heparin?

Low-molecular-weight heparin does not cross the placenta and therefore cannot harm your baby.

There may be some bruising where you inject – this will usually fade in a few days. One or two women in every 100 (1–2%) will have an allergic reaction. If you notice a rash after injecting, you should inform your doctor so that the type of heparin can be changed.

How long will I need to take heparin?

If you have any of the risk factors listed on page 2, you might need heparin during pregnancy. You should thus see your GP, midwife or obstetrician as early as possible so that heparin can be started at the right time. For some women, this may be before their booking appointment.

The length of time you will be advised to stay on heparin depends on your risk factors and whether your situation changes. It may be that treatment is recommended for only a few days to cover long-distance travel, or treatment may be recommended for the week immediately after delivery. Sometimes, treatment may be recommended for the whole of your pregnancy and for up to 6 weeks after the birth.

What should I do when labour starts?

If you think you are going into labour, do not have any more injections. Phone your maternity unit and tell them that you are on heparin treatment. They will advise you what to do.

An epidural injection (a regional anaesthetic injection given into the space around the nerves in your back to numb your lower body) cannot be given until 12 hours (24 hours if you are on a high dose) after your last injection. You will have the option of alternative pain relief.

If the plan is to induce labour, you should stop your injections 12 hours (24 hours if you are on a high dose) before the planned date.

What happens if I have a caesarean section?

If your baby needs to be born by emergency caesarean section within 12 hours (24 hours if you are on a high dose) of your last heparin injection you will not be able to have an epidural or spinal injection and instead will need a general anaesthetic for your operation.

If you are having a planned caesarean section, your last heparin injection should be 12 hours (24 hours if you are on a high dose) before the planned caesarean delivery. Heparin will usually be restarted within 4 hours of the operation.

What happens after birth?

It is important to be as mobile as possible after you have had your baby and to avoid becoming dehydrated.

A risk assessment will be carried out after the birth of your baby. Even if you weren't having injections in pregnancy, you may need to start heparin injections for the first time after birth. This will depend on what risk factors you have for a DVT. You may be advised to have heparin for 7–10 days after birth or sometimes for 6 weeks after birth.

If you were on heparin before the baby's birth, you are likely to be advised to continue this for 6 weeks afterwards.

If you were taking warfarin before pregnancy and have changed to heparin during pregnancy, you can change back to warfarin usually 3 days after birth.

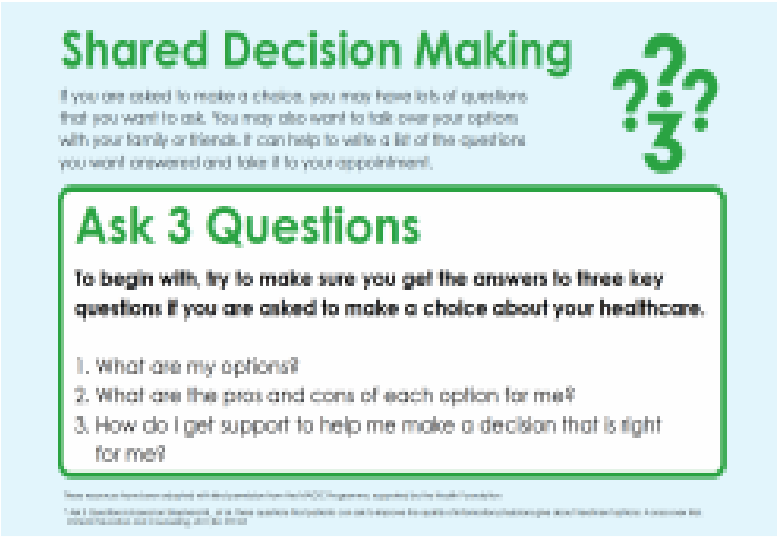
At your postnatal appointment, your doctor should:

- discuss future pregnancies – you may be recommended heparin treatment during and after your next pregnancy but if, for example, you stop smoking or lose weight before your next pregnancy, heparin treatment may not be necessary next time
- discuss your options for contraception – you may be advised not to use any contraception that contains estrogen, such as the 'combined pill', as this can also add to your risk of DVT.

Can I breastfeed?

Yes – both heparin and warfarin are safe to take when breastfeeding.

Making a decision



Appendix 4 Patient counselling and consent for imaging in suspected PE

Consent form for CTPA scan during Pregnancy

(to be retained in patient's notes)

Name:.....

Hospital Number:.....

Date of birth:.....

Consultant:.....

Pregnancy is associated with up to a tenfold increase in clots (thrombosis) in the leg veins which can travel to the lungs causing pulmonary embolism (PE). This is one of the leading direct causes of maternal death in the UK and may present with breathlessness, chest pain or collapse. Untreated PE in pregnancy has a death rate of 15-30%. The diagnosis of PE is therefore important not to miss. A scan called a CT pulmonary angiogram (CTPA) is used to detect the PE in the form of clots in the arteries supplying the lungs. The scan involves radiation and intravenous contrast or 'dye'. There are risks associated with radiation and to avoid this you will have already had ultrasound (involving no radiation) to look for deep vein thrombosis (DVT) in both your legs. The treatment for clot is similar whether it is found in your legs or lungs. Unfortunately, in your case, despite your leg scans being negative we are still concerned that you may have a PE and a CTPA is required to detect this.

The radiation exposure from having a CTPA may affect you and your baby. There is an extremely slight increase (1 in 1,000,000) risk of childhood cancer in your unborn baby. Studies suggest the greater risk is to you as the mother, with a lifetime risk of breast cancer following radiation exposure with the CTPA increased by 13.6%. With newer CT scanners and lower doses of radiation now being used the risk of breast cancer is likely to be lower than originally thought.

The contrast or 'dye' injected into a vein is used to make the clots visible on the CTPA scan. There is no reported risk to an unborn child, however if you are breastfeeding a child you should express enough milk to cover a 24 hour period after your CTPA when it is advised not to breastfeed. Please tell us if you've had a previous reaction of any type to contrast dye or iodine.

An alternative (VQ) scan which is not available at Arrowe Park Hospital, involves lower doses of radiation to your breast tissue but higher risks of childhood cancer in your unborn baby. The VQ scan also is less accurate at detecting PE compared with the CTPA. The VQ scan, unlike the CTPA, is unable to detect other chest problems that may be causing your symptoms.

Statement of health professional:

I have explained the intended benefits and the risks associated with the CTPA scan during pregnancy as detailed above to the patient named above. I confirm that the patient has the capacity to consent.

Signed..... Job title..... Date..... Name (PRINT).....

Statement of patient:

I agree to the CTPA scan and understand the information given to me.

Signed..... Date.....

Name (PRINT).....

Appendix 5 Flow chart of VTE assessment & prophylaxis in Pregnancy & Puerperium

VTE assessment & prophylaxis
Pregnancy/Puerperium

At booking if woman identified to have had a previous VTE refer urgently to Medical ANC

The booking midwife fills Antenatal Risk Assessment Form, documents score (even if score is zero), sign and date the form

Attach Risk Assessment Form to page 10 in Maternity Hand-held notes

Booking VTE score 1
Advice on VTE risk reduction, provide RCOG PIL

Booking VTE Score 2
Advice on VTE risk reduction, RCOG PIL, advice 10 day postnatal LMWH

Booking VTE score 3
Advice on VTE risk reduction, RCOG PIL, Refer ANC at 26 weeks, advice LMWH from 28 weeks & 6 weeks PP

Booking VTE score ≥ 4
Urgent referral to ANC (see as soon as possible)
Prescribe antenatal prophylaxis if not contraindicated
Give RCOG PIL / Anaesthetic referral
Write plan for post-natal period in hand-held notes

Risk assess at any admission
(score 2 or more prescribe LMWH)

Non-obstetric admission
Or
Seen in A&E with Medical/surgical condition

Inform Obstetric team

Consider VTE prophylaxis

Reassess at 28 weeks & 36/40 weeks
(> 12 kg weight gain, check risk score again)
Score ≥ 3 prescribe LMWH

Risk assess after delivery/ Reweigh if possible
(> 12 kg weight gain from booking – use recent weight)

Score 2 prescribe LMWH for 10 days
Score ≥ 3 prescribe LMWH for 6 weeks