Trust Guideline on Prophylactic Anticoagulation in Pregnancy

Document Control:

For Use In:	NNUH		
	Maternity Services		
Search Keywords	Venous thromboembolism (VTE), Pulmonary Embolism (PE), Low Molecular Weight Heparin (LMWH), Thrombosis Risk Assessment (TRA).		
Document Author:	Consultant Haematologist Updated Senior Registrar Obstetrics and Gynaecology		
Document Owner:	Consultant Haematologist		
Approved By:	Maternity Guidelines Committee (MGC) Clinical Guidelines Assessment Panel (CGAP)		
Ratified By:	Clinical Safety and Effectiveness Sub-Board		
Approval Date:	8th December 2023	**Date to be reviewed by:** This document remains current after this date but will be under review	8th December 2026
Implementation Date:	N/A		
Reference Number:	878		

Version History:

Version	Date	Author	Reason/Change
V8.0	12/2020	H Lyall and T Johal	Amended by Beth Gibson. Change is to include the Safer Practise Notice December 2020.
V9.0	06/2021	Hamish Lyall	Appendices 2 and 3 removed to become individual documents. (In agreement with Hamish Lyall).
V10.0	11/2023	Hamish Lyall	Amended by Victoria Wallis. Updated to include latest MBRRACE data, renal dosing and confirmation of use of LMWH alongside Aspirin due to PET risk.

Previous Titles for this Document:

Previous Title/Amalgamated Titles	Date Revised
None	Not applicable

Distribution Control

Printed copies of this document should be considered out of date. The most up to date version is available from the Trust Intranet.

Consultation

The following were consulted during the development of this document:

- Consultant Anaesthetist
- Consultant Haematologist
- Maternity Clinical Guidelines Committee

Monitoring and Review of Procedural Document

The document owner is responsible for monitoring and reviewing the effectiveness of this Procedural Document. This review is continuous however as a minimum will be achieved at the point this procedural document requires a review e.g., changes in legislation, findings from incidents or document expiry.

Relationship of this document to other procedural documents

This document is a clinical guideline applicable to NNUH; please refer to local Trust's procedural documents for further guidance, as noted in Section 5.

Trust Guideline on Prophylactic Anticoagulation in Pregnancy

Contents Page

Quick reference - Flowchart 1: Booking

Quick reference - Flowchart 2: Antenatal Clinic

Special cases

Recurrent VTE +/- thrombophilia.	Therapeutic LMWH antenatally and for 6 weeks postpartum. Refer maternal medicine meeting. Monitoring not required
Antithrombin deficiency.	Therapeutic LMWH antenatally and for 6 weeks postpartum. Discuss with Haematology and refer to maternal medicine. Anti Xa monitoring required
Antiphospholipid antibody syndrome AND previous VTE	Therapeutic LMWH antenatally and for 6 weeks postpartum. Discuss with Haematology and refer to maternal medicine. Monitoring not required
Mechanical heart valves	Inform consultant cardiologist and consultant Obstetrician urgently. **Twice** Daily Dalteparin is essential. Monitor Anti Xa level

Quick reference - Flowchart 3: Antenatal Admission

Quick reference - Flowchart 4: Postpartum

Trust Guideline on Prophylactic Anticoagulation in Pregnancy

1. Introduction

1.1. Rationale

NB: For treatment of VTE in pregnancy, see separate guideline: **Therapeutic Anticoagulation in Pregnancy AO1a**

Thrombosis and thromboembolism remains the leading cause of direct maternal death during or up to six weeks after the end of pregnancy (MBRRACE 2023). Pregnancy increases the relative risk of VTE six-fold compared to the background, non-pregnant population and complicates 1–2:1000 pregnancies.

1.2. Objective

The objective of this clinical guideline is to give empirical guidance on steps to reduce venous thromboembolism (VTE) in pregnancy and the puerperium.

1.3. Scope

This document is for use by medical and midwifery staff working within NNUHFT.

1.4. Glossary

The following terms and abbreviations have been used within this document:

Term	Definition
NNUHFT	Norfolk and Norwich University Hospital Foundation Trust
VTE	Venous Thromboembolism
PE	Pulmonary Embolism
LMWH	Low Molecular Weight Heparin
MGC	Maternity Guidelines Committee
CGAP	Clinical Guidelines Assessment Panel
TRA	Thromboprophylaxis Risk Assessment
FH	Family History
DVT	Deep Vein Thrombosis
GP	General Practitioner
LSCS	Lower segment caesarean section
TEDs	Anti-embolism stockings.
PPH	Post partum haemorrhage.
IU	International Units
Ml	Millilitres
INR	International normalised ratio blood test.
ANC	Antenatal Clinic

2. Responsibilities

All NNUH Maternity Obstetric, Midwifery staff members are required to remain up to date with the guidance included in this document. When pregnant women are cared for outside of Maternity due to coincidental illness this guidance should still be followed and hence all staff should be aware of it.

3. Processes to be followed.

3.1. Risk Assessment to identify those of risk of VTE during pregnancy.

See Flowchart for the Risk Assessment Pathway.

At the consultant clinic:

- If there is a family history of unprovoked or oestrogen provoked thrombosis in a first-degree family member < 50 years old and the woman has not been tested before, perform an **antenatal obstetric thrombophilia screen** that is available under the profiles tab on ICE.
- If this screen is negative, the patient still scores 1 point for FH of VTE. If it is positive, this score may be higher depending on specific result.
- If there is a personal history of unprovoked DVT the woman should be tested for the antenatal obstetric thrombophilia screen as above plus Anticardiolipin antibody and Lupus anticoagulant antibodies.
- The implications for analgesia/ anaesthesia in labour / delivery (including epidural use and the possible need for general anaesthesia) should be discussed.
- An individual management plan should be documented in the health records of women who require thromboprophylaxis.
- If prophylactic anticoagulation is required to start immediately, a prescription should be written and pharmacy will provide a maximum of 3 months. A letter should be written to the GP asking them to continue the prescription.
- In cases where LMWH is being prescribed by the NNUH, and the treatment is to be started at 28 weeks, recall the patient to the clinic for the prescription. Pharmacy will issue to a maximum of 3 months from one prescription, and if appropriate arrange delivery to the local GP surgery. Ensure pharmacy are aware of the GP address. The patient is to inform pharmacy if no further supplies are needed or if further supplies are needed.
- Women who are fully anticoagulated (as opposed to those receiving prophylaxis) should be notified to the Maternal Medicine Secretary.

3.2. Pharmacological agents for thromboprophylaxis.

- Low molecular weight heparins (LMWH) are the agents of choice for antenatal thromboprophylaxis. Aspirin is not recommended as thromboprophylaxis but may be required in addition if the woman is considered moderate to high risk for pre-eclampsia (see separate guideline Management of Pre-Eclampsia and Hypertensive Disorders in Pregnancy)

Dose required.
For most women having antenatal thromboprophylaxis, the dose required depends on booking weight.

Booking Weight (see above)	Dalteparin Dose
<50 kg	2500 units once daily
50 – 90 kg	5000 units once daily
91-130 kg	7500 units once daily
131-170 kg	10000 units once daily
>170kg	75units/kg/day
Therapeutic anticoagulation	See guideline: Therapeutic Anticoagulation in Pregnancy AO1a

LMWH is excreted renally thus dose adjustment may be necessary in women with impaired renal function. This is generally advised where creatinine clearance <30 ml/min for enoxaparin/dalteparin and <20 ml/min for tinzaparin.

3.3. Risk assessment on hospital admission or delivery.

An individual risk assessment of thrombotic risk should be undertaken using:

Antenatal In patient Thromboprophylaxis Risk Assessment (TRA) Trustdocs ID 18764

Or

Obstetric Thromboprophylaxis Risk Assessment (TRA) Trustdocs Id 18766

- By medical staff for all women who are admitted to hospital and seen by a doctor on admission.
- By midwifery staff for all women admitted to hospital and seen by a midwife on admission.
- By medical staff within 24 hours of admission if admitted by midwifery staff and remain undelivered.
- At delivery for all women by the health professional responsible for the delivery or the anaesthetist if delivered by emergency LSCS.
- A TRA sticker should be placed in the hand held notes on each admission.

Action to be taken in response to risk assessment on admission or delivery

- Any hospital admission triggers thromboprophylaxis during that admission, unless there is a possibility of labour/ delivery in the next 24 hours or LMWH is contraindicated.
- Women who score 2 or 3 at delivery should be offered thromboprophylaxis for 10 days postnatally.
- Women who score 3 or more antenatally or 4 at delivery should be offered thromboprophylaxis for 6 weeks postnatally.

- All women having thromboprophylaxis antenatally should have post natal thromboprophylaxis recommended for 6 weeks.
- An individual management plan should be documented in the health records of women who will require thromboprophylaxis.
- The woman will be taught how to self-administer LMWH. Sharps bins are su.7.pplied by the manufacturer and can be found on Blakeney ward. Women should bring these to their GP for disposal.
- **Consider** combined prophylaxis with LMWH plus mechanical prophylaxis for pregnant women or women who gave birth the past 6 weeks and who are likely to be immobilised, or have significantly reduced mobility relative to their normal or anticipated mobility for 3 or more days after surgery, including caesarean section:
    - Use intermittent pneumatic compression as first-line treatment.
    - If intermittent pneumatic compression is contraindicated or unavailable, use anti-embolism stockings (TEDs) see Appendix 3.

3.4. General Advice

- Regardless of their risk of VTE, immobilisation of women during pregnancy, labour and the puerperium should be minimised and dehydration should be avoided.
- LMWH should be omitted if the woman is suspected to be in labour or undergoing induction of labour, except where an alternative plan has been specified.
- Postpartum prophylaxis should begin as soon as possible after vaginal delivery provided that there is no ongoing postpartum haemorrhage (PPH), and 4 hours have passed since insertion or removal of epidural catheter. See below for guidance regarding regional anaesthesia.
- Women should be fitted with anti-embolism stockings (TEDs).
- The risk of VTE reduces when the woman is mobile postpartum, but does not disappear. On discharge home, thromboprophylaxis should be continued and the full course completed.
- All women with previous VTE or thrombophilia should be encouraged to wear graduated elastic compression stockings throughout their pregnancy and for 6 to 12 weeks after delivery.

3.5. Regional Anaesthesia.

The following guidance about timing of LMWH administration in relation to regional anaesthesia must be followed. If unsure please seek further clarification from the on call obstetric anaesthetist (bleep 0011).

- Regional anaesthesia must not be used until 12 hours after a prophylactic dose of LMWH
- Regional anaesthesia must not be used until 24 hours after:
    - A therapeutic dose of LMWH.

  - A prophylactic dose of LMWH in women also on higher dose (150mg) Aspirin.
  - An intermediate dose of LMWH (which has been commenced under advice of a haematologist)
- Epidural catheters can also not be removed until 12 hours after a prophylactic dose of LMWH or 24 hours after a therapeutic dose.
- LMWH must not be given for at least 4 hours after spinal anaesthesia or the insertion or removal of an epidural catheter.

3.6. Monitoring.

Platelet count monitoring is not required.

Anti-Xa level monitoring is not required for women receiving prophylactic doses of LMWH. For treatment doses of LMWH anti-Xa levels are not required except in antithrombin deficiency, and certain women with cardiac disease, provided the woman has normal renal function. Anti Xa peak levels should be taken 4 hours after a dose, therapeutic range is 0.5-1.0 IU/ml. A higher range of 1.0-1.4 IU/ml is recommended for patients with mechanical valves.

Dose reductions may be required if the creatinine clearance is <20 mL/min.

3.7. Contraindications to LMWH

- High risk of major haemorrhage or active antenatal or postpartum bleeding.
- Recent acute stroke/severe renal or liver disease with coagulopathy/varices.
- BP>200 systolic or 120 diastolic.
- Possibility of labour / preeclampsia / placenta praevia: discuss with Obstetric registrar before administration.
- Possibility of requirement for regional analgesia or anaesthesia within the next 12 hours.
- Insertion or removal of the epidural catheter within the preceding 4 hours.
- Bleeding diathesis / Thrombocytopenia (platelet count < 75).
- Patient declines treatment.
- Allergy to LMWH: discuss with haematologist.

Warfarin should be avoided during pregnancy unless absolutely necessary e.g. women with metal heart valves when an individualised plan should be urgently made with the consultant cardiologist. Warfarin can be started on the 5th postpartum day. LMWH should be continued until the INR is within the target range for that patient.

Care during labour and delivery of women on thromboprophylaxis including use of regional anaesthesia.

Once a woman on LMWH is in labour or thinks she is labour, she should be advised not to inject any further LMWH. She should be reassessed on admission to hospital and further doses should be prescribed by medical staff.

For women receiving therapeutic doses, an individual plan will be made by the consultant obstetrician. Frequently the dose of heparin will be withheld on the day of delivery or reduced to a prophylactic dose on the day before induction of labour or elective caesarean section.

3.8. Caesarean Section Prophylaxis.

For all patients having caesarean delivery (both under regional and general anaesthesia), the first post-operative dose of LMWH should be prescribed given 4 hours from the end of surgery/removal of epidural catheter (if applicable). Subsequent doses should be prescribed as close to (but not more than) 24 hours after this dose. The timing of these subsequent doses should coincide with drug rounds on Blakeney Ward (i.e., 06:00, 12:00, 18:00 or 22:00).

For caesarean sections, the LMWH should be prescribed by the anaesthetist.

Adequate hydration should be ensured, and early mobilisation and TED stockings should be advised for all women following caesarean section. Calf compression at the time of the operation is important.

4. Related Documents

Antenatal In patient Thromboprophylaxis Risk Assessment (TRA) Trust Docs ID: 18764

Obstetric Thromboprophylaxis Risk Assessment (TRA) Trust Docs ID: 18766

5. References

1) British National formulary Edition 62, September 2011, BMJ Group.
2) Low-molecular-weight heparins for thromboprophylaxis and treatment of venous thromboembolism in pregnancy: a systematic review of safety and efficacy. Blood 2005 Jul 15;106 (2):401-7 I Greer et al.
3) MBRRACE Saving Lives, Improving Mothers' Care. Lessons learned to inform future maternity care form the UK and Ireland Confidential Enquires into Maternal Deaths and Morbidity 2019-2021. October 2023.
4) Reducing the risk of thromboembolism during pregnancy, birth and the puerperium. RCOG Green-top Guideline No. 37a. April 2015. RCOG Press: London.
5) Thromboprophylaxis in pregnancy: a practical guide for the Obstetrician. Obstetrics, Gynaecology and Reproductive Medicine. 2023; DOI: https://doi.org/10.1016/j.ogrm.2023.09.003. Timmons et al.
6) Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism. NICE clinical guideline 89. August 2019.

6. Monitoring Compliance

Monitoring Compliance with the process will be monitored through the following:

Key elements	Process for Monitoring	By Whom (Individual / group /committee)	Responsible Governance Committee /dept	Frequency of monitoring
Hospital Acquired Venous Thromboembolism is trigger for Datix reporting	Datix investigation	Maternity Risk and Governance Team	Maternity Risk and Governance Team	Case by Case

The Datix investigation results will be reviewed within the Risk and Governance team. Where learning is identified this will be shared at Maternity Clinical Governance where recommendations for further action will be discussed to ensure that the actions and recommendations are suitable and sufficient.

7. Appendices

7.1. Appendix 1: Booking TRA risk assessment for handheld notes and use by Community midwives.

Antenatal Thromboprophylaxis Risk Assessment (TRA)			
Lower risk less than 3 of the following risk factors		**Higher risk** any of the following factors	
	Age > 35 years		Previous personal proven thromboembolic episode: **refer within 1 week**
	Gross varicose veins		Medical co-morbidity i.e. inflammatory conditions, heart/lung disease, SLE, cancer, sickle cell disease, iv drug abuse
	Parity ≥ 3		
	BMI ≥ 30 kg/m² (score 2 if BMI > 40)		
	Smoker		Hyperemesis / ovarian hyperstimulation syndrome **until recovered**
	Current systemic infection		Any Thrombophilia e.g. antiphospholipid syndrome, Factor V Leiden, Protein C or S deficiency, antithrombin deficiency, Prothrombin gene mutation
	Multiple pregnancy / Assisted reproductive technique		
	Dehydration		**Any 3 or more** of the 'lower risk' factors
	Immobility / journey >4 hours		
	Family history of unprovoked or oestrogen related VTE in first degree family member where thrombophilia testing not performed or results not available, if not done perform antenatal Thrombophillia screen profile bloods. (Blood profile available on WebICE)		

Women who have been identified as High Risk for venous thromboembolism (VTE) at booking should be referred for a Consultant appointment for further detailed risk assessment

Risk Assessment Result			
	Low Risk (✓)	**High Risk** (✓)	**Referral to ANC recommended**
No further action required		Date Referred: *dd/mm/yyyy*	
		Print Name:	
		Signature:	

7.2. Appendix 2: Post LSCS advice sheet

Our Vision
To provide every patient with the care we want for those we love the most

Norfolk and Norwich University Hospitals NHS
NHS Foundation Trust

Prescription of Low Molecular Weight Heparin Following Caesarean Section

- All Caesarean patients (Elective and Emergency) must have a weight-appropriate stat dose of Dalteparin (see below) prescribed for 4 hours after the end of surgery.
- Subsequent prescription of Dalteparin is based on booking weight (however at the discretion of the prescribing doctor, current weight can be used):
  - less than 50 kg - 2500U once daily
  - 50 to 90 kg - 5000U once daily
  - 91 to 130kg - 7500U once daily
  - 131 to 170kg - 10000U once daily
  - Greater than 170kg - 75U/kg/day
- Regular post natal Dalteparin should be prescribed so that the next dose is given no more than 24 hours after the stat dose.
- Timings of post natal Dalteparin should be as per the prescription chart to coincide with drug rounds:
  - i.e. 6:00, 12:00, 18:00, 22:00.
- If you prescribe Dalteparin it is your responsibility to complete the Thromboprophylaxis Risk Assessment (TRA) on the front of the prescription chart.
- Low Molecular Weight Heparin must not be given within 4 hours of removal of an epidural or insertion of a spinal
- Because of unfamiliarity with the management and timing of removal of epidurals on Blakeney ward, Obstetric patients requiring postoperative epidural analgesia should remain on Delivery Suite.

Dr J Francis
8.1.2016

7.3. Appendix 3: Safer Practice Dec 2020

Safer Practice Notice

Learning from Incidents

Preventing Injury from Anti Embolic Stockings (AES)

A Serious Incident occurred where a patient developed an irreversible injury following the use of anti-embolic stockings.

Two patients have been seen by the TVN's in the last 7 days (w/b 07/12/2020) with Deep Tissue Injury caused by AES

How to safely put on stockings

1. Put your hand into the stocking as far as the heel.
2. Hold the heel and turn the stocking inside out as far as possible.
3. Put the stocking over foot and heel. The centre of the patient's heel should be over the heel pocket of the stocking.
4. Pull the stocking up and fit it around the patient's ankle and calf.
5. Smooth out any spare material making sure the heel is in the heel pocket.
6. The open toe area should be located under the patient's toes

AES Sizing Chart - http://intranet/ClickforClots/index.htm

Are there any pitfalls to avoid or problems to look out for?

⇒ **NEVER** roll the stockings down, as they will form a tight band around the leg. This can be dangerous as it constricts the blood flow and can cause skin sores and other vascular and tissue damage.

⇒ The stockings **MUST** be taken off once a day (for no more than 30 min) for hygiene purposes and to check the condition of the skin.

⇒ If the patient develops pain or discomfort, bruising or blisters or areas where the skin has changed colour, stockings should be removed immediately and **urgent medical review** sought.

⇒ **Be alert** to reports of numbness, pins and needles, pain or soreness in the foot or leg. This will be a sign that the stockings are too tight.

⇒ If a rash develops there may be an allergy to the elastic fibres in the stockings.

⇒ **Non slip foot wear** must be worn to reduce the risk of falls

⇒ **Complete an AES Care Plan for all patients wearing AES**

8. Equality Impact Assessment (EIA)

Type of function or policy	Existing

Division	Women and Children	**Department**	Maternity
Name of person completing form	V Maxey	**Date**	05/12/23

Equality Area	Potential Negative Impact	Impact Positive Impact	Which groups are affected	Full Impact Assessment Required YES/NO
Race	No	No	No	No
Pregnancy & Maternity	No	Prevention of VTE in pregnancy	No	No
Disability	No	No	No	No
Religion and beliefs	No	No	No	No
Sex	No	No	No	No
Gender reassignment	No	No	No	No
Sexual Orientation	No	No	No	No
Age	No	No	No	No
Marriage & Civil Partnership	No	No	No	No
EDS2 – How does this change impact the Equality and Diversity Strategic plan (contact HR or see EDS2 plan)?		No impact		

- **A full assessment will only be required if: The impact is potentially discriminatory under the general equality duty**
- **Any groups of patients/staff/visitors or communities could be potentially disadvantaged by the policy or function/service**
- **The policy or function/service is assessed to be of high significance**

IF IN DOUBT A FULL IMPACT ASSESSMENT FORM IS REQUIRED

The review of the existing policy re-affirms the rights of all groups and clarifies the individual, managerial and organisational responsibilities in line with statutory and best practice guidance.