NHS
Mid and South Essex
University Hospitals Group

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Related Trust Policies (to be read in conjunction with)	04071 Policy for standard infection prevention precautions 07072 Management of a patient reporting an antepartum haemorrhage 07040 Management of pregnant and postnatal patients refusing blood products 04184 Manual of blood transfusion policies and procedures 06029 Transfer of mothers and babies to different care settings 07024 Emergency transport of blood specimens in the event of major obstetric haemorrhage 08014 VTE risk assessment and thromboprophylaxis in Maternity 12007 Management of women with venous thromboembolism (VTE), deep vein thrombosis (DVT) or pulmonary embolism (PE) during antenatal and postnatal period

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1.0	Nina Smethurst		July 2003
2.0	Julie Bishop		July 2006
3.0	Sajida Ajjawi		March 2008
3.1		Equality and diversity; audit and monitoring	November 2009
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6.0	Anita Dutta	Full Review	22nd August 2019

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1.0 Purpose

1.1 This guideline is designed to help maternity staff to manage patients who are on thromboprophylaxis or treatment dose of heparin, and they are in labour and delivery including caesarean section.
(Refer to the guideline entitled 'VTE Risk Assessment and Thromboprophylaxis in Maternity';register number 08014 and '12007)

2.0 Equality Impact Assessment

2.1 Mid Essex Hospital Services NHS Trust is committed to the provision of a service that is fair, accessible and meets the needs of all individuals.
(Refer to Appendix D)

3.0 Background

3.1 Pregnancy is a risk factor for venous thromboembolism (VTE) and is associated with a ten-fold increase compared with the risk for non-pregnant patients.

3.2 Pulmonary thromboembolism (PTE) is the most common direct cause of maternal death in the UK. Three successive reports from the Confidential Enquiries into Maternal Deaths have highlighted failures in recognising risk factors for VTE and employing adequate prophylaxis.

4.0 Risk Assessment

(Refer to the guideline entitled 'VTE Risk Assessment and Thromboprophylaxis in Maternity'; register number 08014; point 5.0).

5.0 Recommendations

5.1 Women who are on pharmacological antenatal thromboprophylaxis require anaesthetic referral to discuss an individual plan for intrapartum and delivery analgesic options.

5.2 Very high risk patients require multidisciplinary team management i.e. haematologist, obstetrician and anaesthetist involvement.

5.3 All women who require elective caesarean section should have a VTE assessment at 36 weeks or at gestation appropriate for clinical condition in the Antenatal Clinic.

5.4 All women who require emergency caesarean section require VTE assessment when decision for caesarean section has been made.

5.5 Full blood count (FBC), clotting and group and save – to be performed at least 3 days prior to the day of elective caesarean section or induction of labour and on the day if the patient goes into labour.

5.6 Anaesthetist may consider regional analgesia provided INR less than 1.5, platelets count >80 x 10^9 /L; but every case should be considered on its merits.

5.7 Elective induction of labour may be indicated in some women (particularly those on high-dose prophylactic or treatment doses of LMWH) to help plan for thromboprophylaxis around delivery.

5.8 Gestation as an indication for induction of labour should be based on other obstetric indications and favourability of cervix; as stopping of LMWH during a long induction process will expose women to high risk of VTE.

5.9 If LMWH precludes regional techniques (for example, the woman who presents in spontaneous labour within 12 hours of taking a LMWH dose) alternative analgesia such as opiate-based intravenous patient controlled analgesia can be offered.

5.10 Advise anaesthetic registrar of the patient's admission to the Maternity Unit who were on antenatal LMWH.

5.11 All women who have had a caesarean section in labour require postpartum clexane (thromboprophylaxis) for at least 10 days. If elective caesarean section, they should receive 10 days of LMWH postnatally only if other risk factors are present.

5.12 Women may require clexane for a longer duration dependant on individual risk assessment.
(Refer to VTE risk assessment for maternity cases)

5.13 The anaesthetic registrar should prescribe the initial dose (time to be given) and duration of postnatal clexane as per clinical requirement.

5.14 Postpartum thromboprophylaxis should be given as soon as possible after delivery, provided that there is no postpartum haemorrhage.

5.15 Those with postpartum haemorrhage should be fitted with thromboembolic deterrent stockings.

6.0 Spontaneous Labour and who are on Antenatal LMWH

6.1 To advise women not to inject further LMWH, if they have any vaginal bleeding or once regular contraction begins.

6.2 They should be reassessed on admission to hospital and further doses should be prescribed by medical staff.

6.3 Inform anaesthetist on admission of patient to Maternity Unit.

7.0 For Induction of Labour in Women Receiving Antenatal LMWH

7.1 For women receiving **prophylactic dose** of LMWH, omit the injection on the day of induction of labour.

7.2 For women receiving **high prophylactic** or **therapeutic doses of** LMWH, the dose of heparin should be reduced to its thromboprophylactic dose on the day before induction of labour and, if appropriate, continued in this dose during labour.

7.3 If LMWH has not been given for 24 hours and the woman (who was on high prophylactic/ therapeutic dose) has not yet delivered; and there is concern about delaying further doses of LMWH, a prophylactic dose of 5000 iu subcutaneously of unfractionated heparin should be administered.

7.4 Repeat unfractionated heparin every 12 hours until LMWH can be resumed after delivery.

7.5 The required interval between a prophylactic dose of unfractionated heparin and regional analgesia or anaesthesia is lesser than with LMWH (12 hours) and there is less concern regarding neuraxial haematomas with unfractionated heparin.

8.0 For Elective Caesarean Section in Women Receiving Antenatal LMWH

8.1 The woman should receive a thromboprophylactic dose of LMWH on the day before delivery. On the day of delivery, any morning dose should be omitted and the operation should be performed that morning.

8.2 For women receiving high prophylactic or therapeutic doses of LMWH, the dose of heparin should be reduced to its thromboprophylactic dose (Clexane ≤ 40 mg) on the day before caesarean section.

9.0 Regional Analgesia and to Minimise the Risk of Epidural Haematoma

9.1 Regional techniques should not be used until at least 12 hours after the previous prophylactic dose of LMWH and at least 24 hours after the last therapeutic dose of LMWH.

9.2 Subcutaneous unfractionated heparin should be discontinued 12 hours before induction or regional anaesthesia; and intravenous unfractionated heparin stopped 6 hours before these procedures.

9.3 Trust anaesthetists consider clexane ≤ 40 mg as a prophylactic dose and clexane >40 mg as a treatment dose, when considering regional analgesia.

9.4 LMWH should not be given for 4 hours after use of spinal anaesthesia or after the epidural catheter has been removed; for 6 hours if the procedure was traumatic.

9.5 The epidural cannula should not be removed within 12 hours of the most recent LMWH injection.

9.6 Epidural anaesthesia can be sited only after discussion with a senior anaesthetist.

10.0 Specific Surgical Measures for Anticoagulated Women Undergoing Delivery by Caesarean Section

10.1 Bleeding complications appear to be very uncommon with LMWH. But, there is an increased risk of wound haematoma following caesarean section with both unfractionated heparin and LMWH of around 2%.

10.2 In women receiving therapeutic doses of LMWH, wound drains (abdominal and rectus sheath) should be considered at caesarean section and the skin incision should be closed with staples or interrupted sutures to allow drainage of any haematoma.

11.0 Management for Women at High Risk of Haemorrhage

11.1 Any woman who is considered to be at high-risk of haemorrhage and in whom continued heparin treatment is considered essential should be managed with intravenous, unfractionated heparin until the risk factors for haemorrhage have resolved.

11.2 Risk factors include major antepartum haemorrhage, coagulopathy, progressive wound haematoma, suspected intra-abdominal bleeding and postpartum haemorrhage.

11.3 Unfractionated heparin has a shorter half-life than LMWH and its activity is more completely reversed with protamine sulphate.

11.4 If a woman develops a haemorrhagic problem while on LMWH, the treatment should be stopped and expert haematological advice sought.

12.0 Postpartum Management

12.1 For thromboprophylaxis refer to the guideline entitled ‘VTE Risk Assessment and Thromboprophylaxis in Maternity’; register number 08014.

12.2 For treatment of DVT or PE refer to the guideline entitled ‘Management of women with venous thromboembolism (VTE), deep vein thrombosis (DVT) or pulmonary embolism (PE) during antenatal and postnatal period’; register number 12007.

12.3 The anaesthetic registrar should prescribe postnatal clexane subcutaneous as per clinical requirement i.e. time of initial dose to be given and total duration.

12.4 The first thromboprophylactic dose of LMWH should be given as soon as possible 4-8 hours after delivery provided that there is no postpartum haemorrhage and who has no regional analgesia

12.5 If there has been regional analgesia, LMWH should be given by 4 hours after delivery or 4 hours after removal of the epidural catheter; for 6 hours if the procedure was traumatic.

12.6 If the epidural catheter is left in place after delivery for the purpose of postpartum analgesia, it should be removed 12 hours after last dose of LMWH and 4 hours before the next dose of LMWH.

13.0 Staff and Training

13.1 All qualified midwifery and obstetric staff are fully trained to perform an initial assessment antenatally and to inform the appropriate multidisciplinary members as necessary.

13.2 Qualified staff should assist midwifery and medical trainee's to learn how to assess and identify patients who may require thrombophrophylaxis as part of their education and skills where appropriate to ensure safe competent practitioner.

14.0 Professional Midwifery Advocate

14.1 Professional Midwifery Advocates provide a mechanism of support and guidance to women and midwives. Professional Midwifery Advocates are experienced practising midwives who have undertaken further education in order to supervise midwifery services and to advise and support midwives and women in their care choices.

15.0 Infection Prevention

15.1 All staff should follow Trust guidelines on infection prevention by ensuring that they effectively 'decontaminate their hands' before and after each procedure.

15.2 All staff should ensure that they follow Trust guidelines on infection prevention. All invasive devices must be inserted and cared for using High Impact Intervention guidelines to reduce the risk of infection and deliver safe care. This care should be recorded in the Saving Lives High Impact Intervention Monitoring Tool Paperwork (Medical Devices).

16.0 Audit and Monitoring

16.1 Topics for formal audit are selected on an annual basis in accordance with the requirements the Clinical Audit Strategy and Policy (register number 08076), the Corporate Clinical Audit and Quality Improvement Project Plan and the Maternity Annual Audit Work Plan.

16.2 Audit of compliance with this guideline will be considered based on national and local audit findings and clinical governance data identifying themes suggesting care

delivery is suboptimal. If audit of this guideline is identified as a priority, the Women's and Children's Clinical Audit Group will identify a lead for the audit.

16.3 The findings of the audit will be reported to and approved by the Women's and Children's Clinical Audit Group and an action plan with named leads and timescales will be developed to address any identified deficiencies. Performance against the action plan will be monitored by this group at subsequent meetings.

16.4 Any significant concerns relating to compliance with the requirements of this guideline will be entered on the local Risk Assurance Framework.

16.5 Key findings and learning points from the audit will be submitted to the Clinical Governance Group within the quarterly Women's and Children's Directorate Governance report.

16.6 Key findings and learning points will be disseminated to relevant staff.

17.0 Guideline Management

17.1 As an integral part of the knowledge, skills framework, staff are appraised annually to ensure competency in computer skills and the ability to access the current approved guidelines via the Trust's intranet site.

17.2 Quarterly memos are sent to line managers to disseminate to their staff the most currently approved guidelines available via the intranet and clinical guideline folders, located in each designated clinical area.

18.0 Communication

18.1 A quarterly 'maternity newsletter' is issued and available to all staff including an update on the latest 'guidelines' information such as a list of newly approved guidelines for staff to acknowledge and familiarise themselves with and practice accordingly.

18.2 Approved guidelines are published monthly in the Trust's Focus Magazine that is sent via email to all staff.

19.0 References

National Institute for Health and Care of Clinical Excellence (2012) Venous thromboembolic diseases: the diagnosis, management of venous thromboembolic diseases and the role of thrombophilia testing (updated 2015) NICE clinical guideline CG144, June.
Available at: https://www.nice.org.uk/guidance/cg144

Royal College of Obstetricians and Gynaecologists (2015); Thromboembolic disease in Thrombosis and embolism during pregnancy and the puerperium: acute management; Green-top Guideline No. 37b

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Prevention and Treatment of Venous Thrombo-Embolism (VTE): Risk Assessment and Prophylaxis; MEHT Clinical Guideline; Register No: 09051

National Institute for Health and Care Excellence (2018) Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism NG89
Available at: https://www.nice.org.uk/guidance/ng89

Saving Mothers' Lives; Reviewing maternal deaths to make motherhood safer: 2006–2008; BJOG An International Journal of Obstetrics and Gynaecology; Centre for Maternal and Child Enquiries; Volume 118, Supplement 1, March 2011
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Monteiro, R, Salman, M et al, 2019 Analgesia, anaesthesia and pregnancy; a practical guide.4th ed. Cambridge University Press 3rd edition available to loan from Warner Library

Appendix A

Antenatal and postnatal prophylactic dose of LMWH

Weight	Enoxaparin	Dalteparin	Tinzaparin
< 50 kg	20 mg	2500 units	3500 units daily
50–90 kg	40 mg	5000 units	4500 units daily
91–130 kg	60 mg	7500 unit	7000 unit daily
131–170 kg	80 mg	10000 unit	9000 unit daily
> 170 kg	0.6 mg/kg/day	75 units/kg/day	75 units/kg/day

Appendix B

Therapeutic dose of LMWH

Calculation of initial doses of drugs by early pregnancy weight

- Enoxaparin 1 mg/kg twice daily;
- Dalteparin 100 units/kg twice daily;
- Tinzaparin (175 units/kg) once daily.

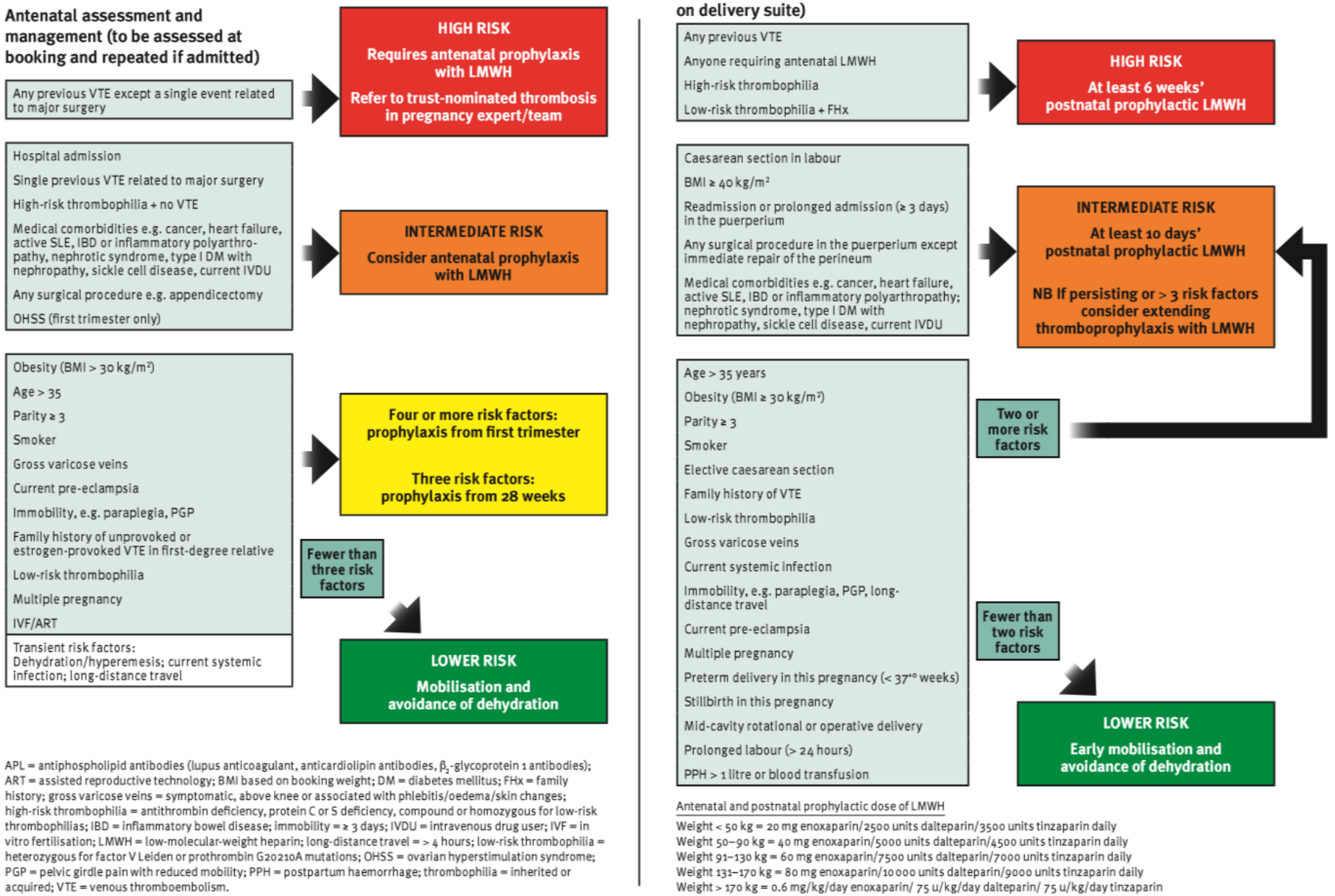
LMWH Therapeutic Dose

	Initial dose Early pregnancy weight (kg)			
	< 50	50–69	70–89	> 90
Enoxaparin	40 mg bd	60 mg bd	80 mg bd	100 mg bd
Dalteparin	5000 iu bd	6000 iu bd	8000 iu bd	10,000 iu bd
Tinzaparin 175 units/kg once daily (all weights)				

bd = twice daily

Appendix C

Appendix I: Obstetric thromboprophylaxis risk assessment and management



APL = antiphospholipid antibodies (lupus anticoagulant, anticardiolipin antibodies, β_2-glycoprotein 1 antibodies); ART = assisted reproductive technology; BMI based on booking weight; DM = diabetes mellitus; FHx = family history; gross varicose veins = symptomatic, above knee or associated with phlebitis/oedema/skin changes; high-risk thrombophilia = antithrombin deficiency, protein C or S deficiency, compound or homozygous for low-risk thrombophilias; IBD = inflammatory bowel disease; immobility = ≥ 3 days; IVDU = intravenous drug user; IVF = in vitro fertilisation; LMWH = low-molecular-weight heparin; long-distance travel = > 4 hours; low-risk thrombophilia = heterozygous for factor V Leiden or prothrombin G20210A mutations; OHSS = ovarian hyperstimulation syndrome; PGP = pelvic girdle pain with reduced mobility; PPH = postpartum haemorrhage; thrombophilia = inherited or acquired; VTE = venous thromboembolism.

Antenatal and postnatal prophylactic dose of LMWH

Weight < 50 kg = 20 mg enoxaparin/2500 units dalteparin/3500 units tinzaparin daily
Weight 50–90 kg = 40 mg enoxaparin/5000 units dalteparin/4500 units tinzaparin daily
Weight 91–130 kg = 60 mg enoxaparin/7500 units dalteparin/7000 units tinzaparin daily
Weight 131–170 kg = 80 mg enoxaparin/10 000 units dalteparin/9000 units tinzaparin daily
Weight > 170 kg = 0.6 mg/kg/day enoxaparin/ 75 u/kg/day dalteparin/ 75 u/kg/day tinzaparin

Obstetric thromboprophylaxis risk assessment and management (including early pregnancy complication in Gynaecological ward)

Mid EssexHospital Services NHS Trust

NHS

- Above and the following tables are for guidance only and not exhaustive lists
- Thromboprophylaxis assessment and management in details – in the guideline 08014, Appendix A and Appendix B
- Ensure good hydration and mobilisation for all antenatal, intra partum and postnatal women

Key

ART = assisted reproductive therapy
BMI = bases on booking weight
Gross varicose vein = symptomatic, above knee, associated with phlebitis, oedema, skin changes,
LMWH + low molecular weight heparin
OHSS =ovarian hyperstimutation syndrome
SPD = symphysis pubis dysfunction

Note: to assess risk of bleeding before prescribing LMWH

Risk factors for bleeding

- Haemophilia or other known bleeding disorder (e.g. 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 ×109)
- Acute stroke in previous 4 weeks (haemorrhagic or ischaemic)
- Severe renal disease (glomerular filtration rate < 30 ml/minute/1.73 m2)
- Severe liver disease (prothrombin time above normal range or known varices)
- Uncontrolled hypertension (blood pressure > 200 mmHg systolic or > 120 mmHg diastolic)
- Concurrent use of anticoagulants (such as warfarin with INR higher than 2)

Anti-embolism stocking

Indications for anti-embolism stockings in pregnancy and the puerperium

- who are hospitalised and have a contraindication to LMWH
- who are hospitalised post-caesarean section (combined with LMWH)
- who arerisk of VTE (such as previous VTE, more than three3 risk factors)
- outpatients with prior VTE (usually combined with LMWH)
- travelling long distance for more than 4 hours.
- symptomatic DVT, patients should wear a tighter-fitted stocking during the day, with an ankle pressure gradient of 30–40 mmHg for 2 years to prevent the post-thrombotic syndrome (and continue for longer if post-thrombotic symptoms are present).

Do not offer anti-embolism stockings to women who have

- suspected or proven peripheral arterial disease
- peripheral arterial bypass grafting
- peripheral neuropathy or other causes of sensory impairment
- any local conditions in which stockings may cause damage, for example fragile 'tissue paper' skin, dermatitis, gangrene or recent skin graft
- known allergy to material of manufacture
- cardiac failure
- severe leg oedema or pulmonary oedema from congestive heart failure
- unusual leg size or shape
- major limb deformity preventing correct fit

Appendix D: Preliminary Equality Analysis

This assessment relates to: Thromboprophylaxis and Treatment during Labour and Delivery Including Caesarean Section/ 08033

A change in a service to patients		A change to an existing policy	**X**	A change to the way staff work	
A new policy		Something else (please give details)			

Questions	Answers
1. What are you proposing to change?	Full Review
2. Why are you making this change? **(What will the change achieve?)**	3 year review
3. Who benefits from this change and how?	Patients and clinicians
4. **Is anyone likely to suffer any negative impact as a result of this change?** If **no**, please record reasons here and sign and date this assessment. If **yes**, please complete a full EIA.	No
5. a) Will you be undertaking any consultation as part of this change? **b) If so, with whom?**	Refer to pages 1 and 2

Preliminary analysis completed by:

Name	Anita Dutta	**Job Title**	Consultant Obstetrician	**Date**	June 2019