University Hospitals of Derby and Burton
NHS Foundation Trust

Trust Policy and Procedures for Venous Thrombo-embolism (VTE) Risk assessment, Thromboprophylaxis and Management in adult in-patients aged 16 years and over

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Version / Amendment History	Version	Date	Author	Reason
	V1	Sept 2011	?	New Policy
	V2	Apr 2015	?	Review and update
	V3	Sept 2016	?	- Update to sections 1,5, 6,7,10 and appendix 1 To comply with NICE CG92 - Sections relating to Meditech V5 amended to Version 6 information (sections 2,3,4)
	V4	Aug 2017	?	Clarification of responsibility to undertake VTE risk assessment (section 2)
	V5	Oct 2018	Lisa Nock	Review and update to comply with NICE NG89

Intended Recipients:

- Consultant Medical Staff
- All Medical and Dental Staff
- All Nursing Staff
- Locum Staff Bank Staff

Training and Dissemination:

To be read in conjunction with:

- Health Record Keeping Policy
- Medicines Management Policy

In consultation with and Date:

EIRA
Stage One Completed
Stage Two Completed

Procedural Documentation Review Group Assurance and Date	
Approving Body and Date Approved	Trust Operational Group
Date of Issue	September 2011
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Contact for Review	Principal Pharmacist – Surgery
Executive Lead Signature	Executive Medical Director
Approving Executive Signature	Chief Executive

GUIDELINES FOR VENOUS THROMBO-EMBOLISM (VTE) RISK ASSESSMENT, THROMBOPROPHYLAXIS AND MANAGEMENT IN IN-PATIENTS AGED 16 YEARS AND OVER

CONTENTS

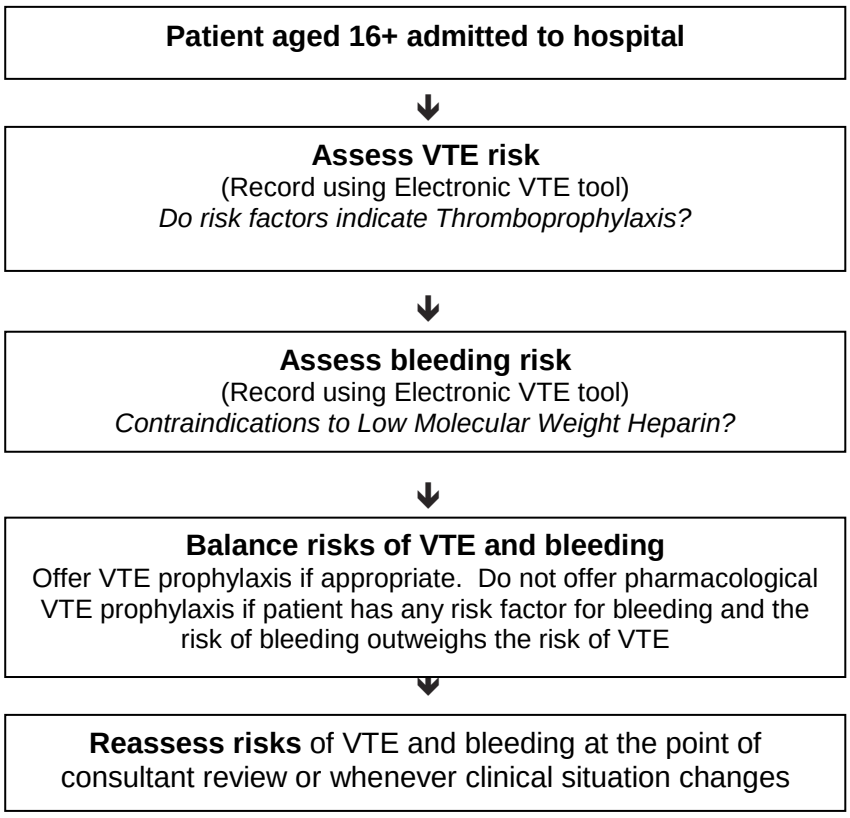
Guidelines for Venous Thrombo-embolism (VTE) Risk assessment, Thromboprophylaxis and Management in In-patients aged 16 years and over

1. OBJECTIVE OF GUIDELINE

To reduce the risk of Venous Thrombo-embolism (VTE) (deep vein thrombosis and pulmonary embolism) in patients aged 16 years and over admitted to hospital. (NICE clinical guideline NG89). Note – Incidences of VTE in < 18 years are very rare. Where VTE occurs in patients < 18 years, it should be discussed with a specialist paediatric haematologist.

2. VENOUS THROMBO-EMBOLISM (VTE) RISK ASSESSMENT

It is the responsibility of all doctors to ensure that all inpatients are assessed for their risk of Venous Thrombo-embolism on admission care pathway as below:



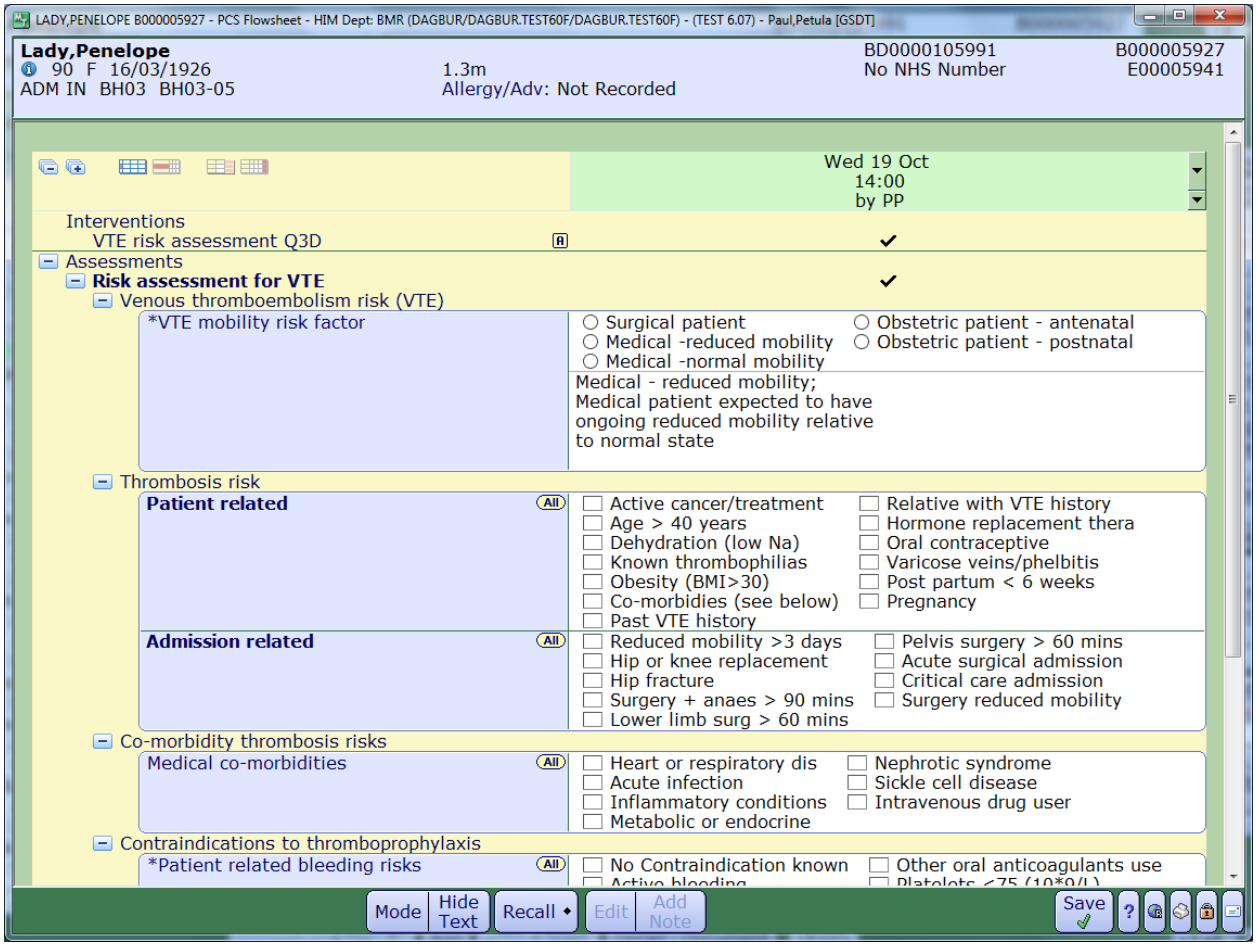
General measures for all patients:

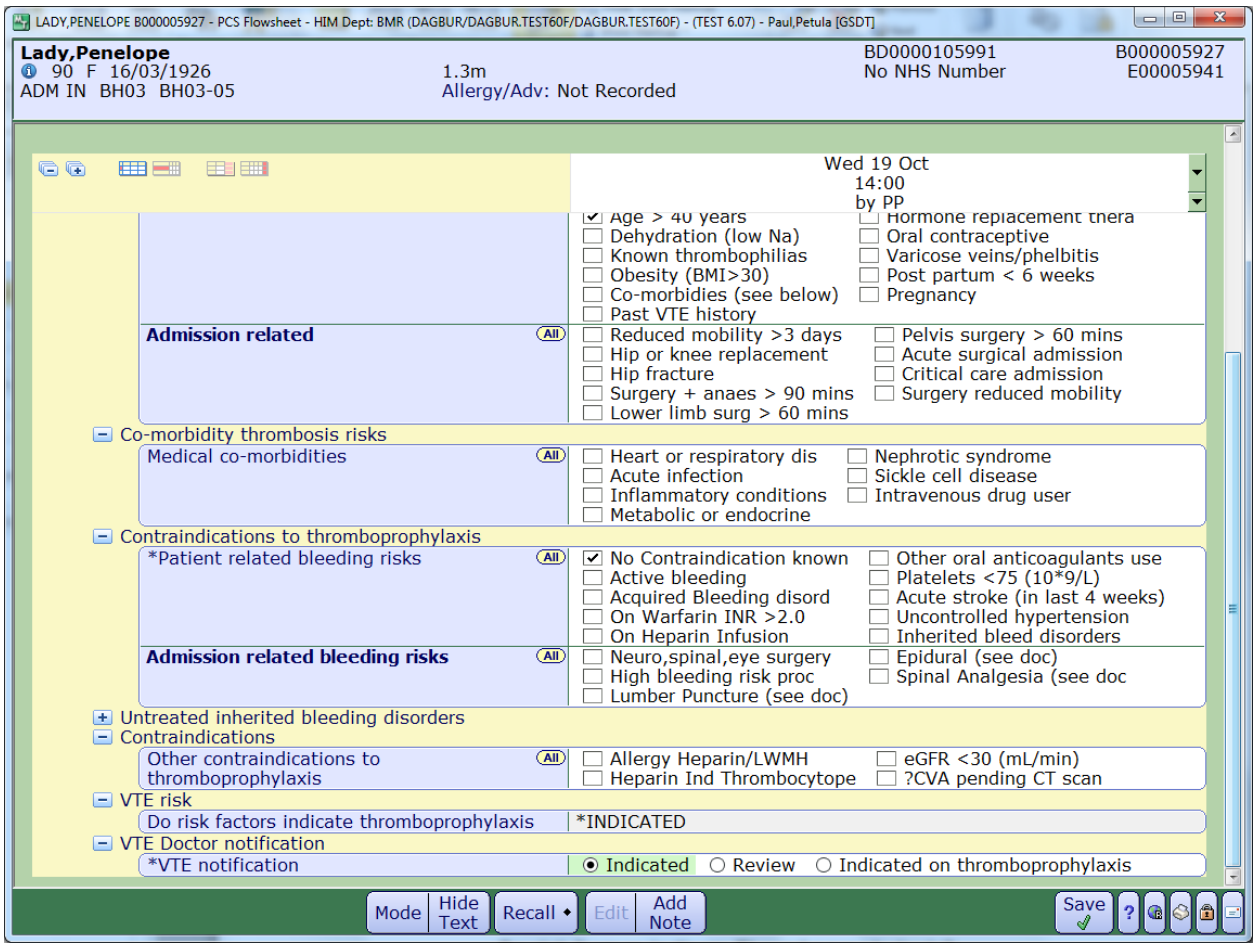
- Do not restrict patients fluid intake unless clinically indicated
- Encourage patients to mobilise as soon as possible
- Aspirin and other anti-platelet agents do not offer adequate prophylaxis for VTE, except in situation as outlined in section 4.3 (ii)
- The patient should also be provided with a "Are you at risk of DVT in hospital" leaflet which should be discussed with the patient.

VTE risk assessment must be recorded by the doctor using the Electronic assessment tool provided in the Hospital Information Support System as follows:

- **After admitting a patient:**

  Available from the PCS status board by clicking on the worklist
  VTE risk assessment forms part of the care plan
  Doctors can record the VTE risk assessment via PCM and document
  Then click on new and select the VTE risk assessment.





The appropriate leaflet should be given to all patients:

For inpatient admissions:

Are you at risk of DVT in Hospital? (available via the Print Centre)

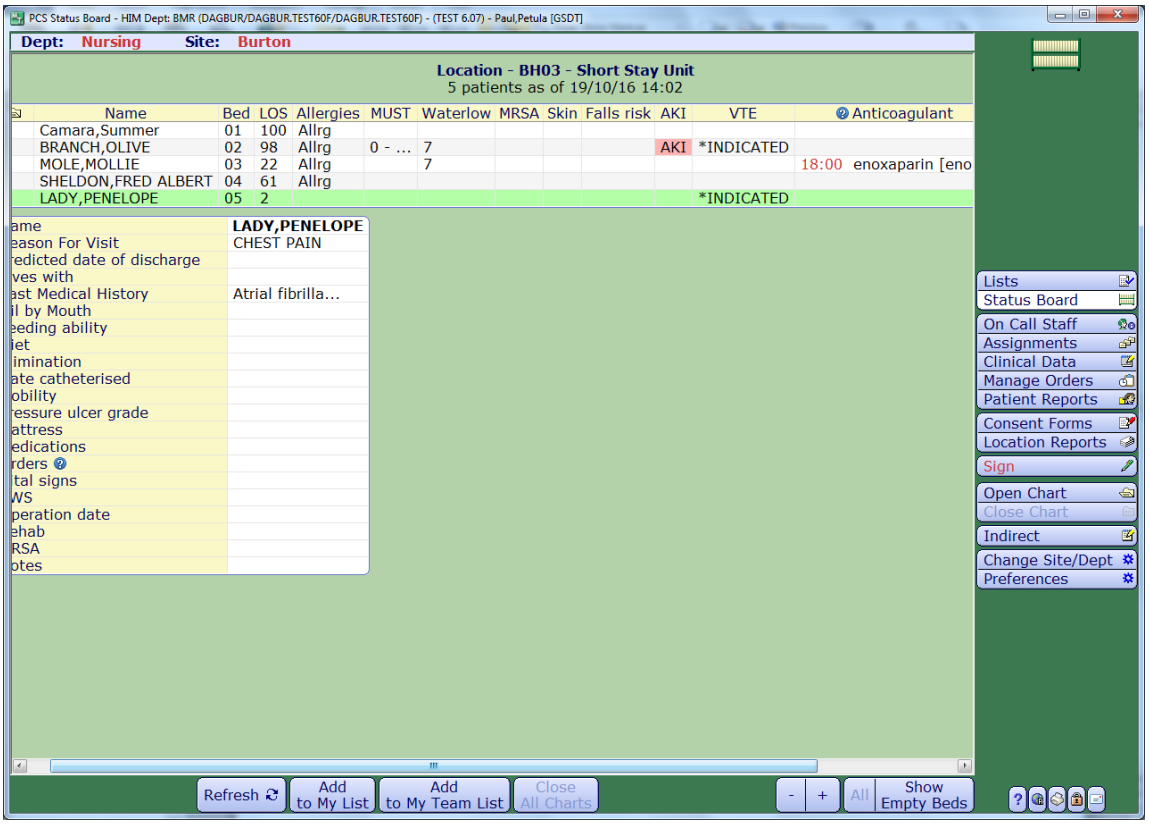
For outpatient and day case admissions:

Are you at risk of DVT? (available via the Print Centre)

3. THE VENOUS THROMBOEMBOLISM RISK ASSESSMENT TOOL

--------- MANDATORY THROMBOPROPHYLAXIS ASSESSMENT ---------

The ward handover status board provides an overview of the VTE risk assessment and which Anticoagulant the patient is prescribed if any



Options:

- ***INDICATED***

  See on-line VTE risk factors guidance below. This assessment value indicates the patient has an immediate increased risk of developing VTE and if there are no contraindications or bleeding risks ***Thromboprophylaxis should be prescribed.***

- ***REVIEW***

  This assessment value indicates the patient has no immediate increased risk of developing VTE. ***Patients should be reassessed at the point of consultant review (post-take ward round), or if their clinical condition changes.***

Please note that in all patients where thromboprophylaxis is indicated, Appropriate prophylaxsis must be started within the first 14 hours of admission, unless there are any contraindications to it. This should be checked on the post take rounds.

3.1 Venous Thromboembolism (VTE) RISK FACTORS

If the patient has any of the following risk factors and there is no contra-indication, prescribe ENOXAPARIN 40mg SC OD. Adjust dose appropriately for renal function or patients at extremes of body weight (see section 4.1). If there is a known allergy to heparins, consider Fondaparinux 2.5 mg OD

Additionally, consider mechanical methods e.g. elastic stockings in addition to Low Molecular Weight Heparin (LMWH).

Please see risk factors listed below:

- **MEDICAL PATIENT**

  1. Significant reduced mobility for 3 days or more
  2. Expected to have ongoing reduced mobility relative to normal
  3. Other VTE risk factor see below

- **SURGICAL PATIENT AND PATIENT WITH TRAUMA**

  1. Total anaesthetic plus surgical time >90 minutes
  2. Surgery involving pelvis or lower limb with a total anaesthetic plus surgical time >60 minutes
  3. Expected to have significant reduction in mobility
  4. Acute surgical admission with inflammatory or intra-abdominal condition
  5. Other VTE risk factor see below

- **PREGNANCY AND UP TO 6 WEEKS POST PARTUM**
  (Including 6 weeks post miscarriage or termination)

  1. Surgery including caesarean section
  2. Age over 35 years discuss with the obstetrician
  3. Other risk factors see below and additional VTE risks in pregnancy

- **OTHER VTE RISK FACTORS**

  1. Patient is > 40 years old (NICE guidelines>60 but ACCP>40)
  2. Active cancer or cancer treatment
  3. Critical care admission
  4. Dehydration (Low plasma sodium)
  5. Obesity (BMI > 30 kg/m2)
  6. Personal history OR first-degree relative with history of VTE
  7. Uses Oral contraception or HRT or Selective oestrogen receptor modulators
  8. Varicose veins with phlebitis
  9. One or more significant medical co-morbidities;
     - Heart or respiratory disease
     - Acute infectious disease
     - Inflammatory conditions
     - Metabolic or endocrine disease
     - Nephrotic syndrome (proteinuria >3g/day)
     - Sickle cell disease
     - Intravenous Drug User

10. Thrombophilia:
    Inherited:
    - Antithrombin deficiency
    - Protein C deficiency
    - Protein S deficiency
    - Factor V Leiden
    - Acquired: (antiphospholipid syndrome)
    - Lupus anticoagulant, anticardiolipin antibodies

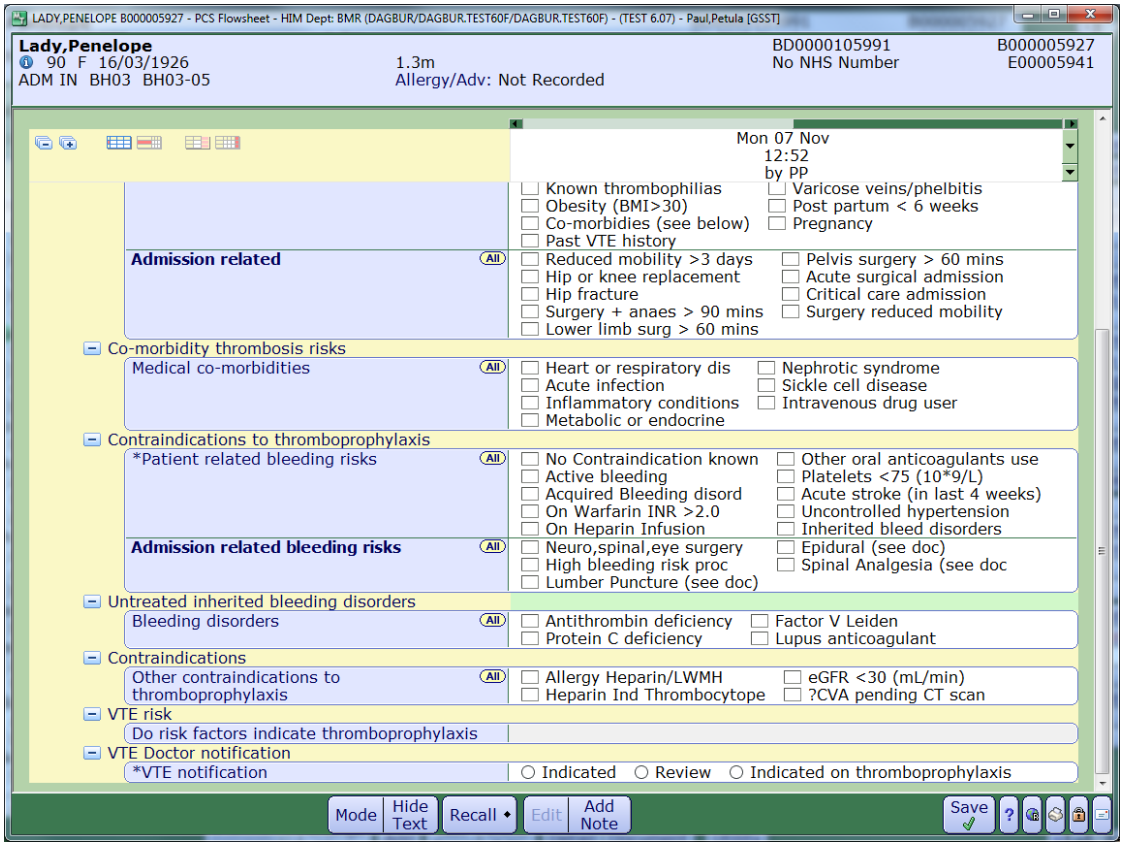
- **ADDITIONAL RISK OF VTE IN PREGNANCY AND THE PUERPERIUM**
  (If any risk factors below are present then discuss with the obstetric team)

1. Obesity pre-pregnancy or early pregnancy (BMI >30kg/m2)
2. Parity≥3
3. Smoker
4. Multiple Pregnancy
5. Excess blood loss (>1 litre) or blood transfusion
6. Hyperemesis
7. Ovarian hyper stimulation syndrome
8. Current pre-eclampsia
9. Prolonged labour, mid-cavity rotational operative delivery
10. Severe infection, e.g. pyelonephritis

(*Reference: Venous Thromboembolism: reducing the risk January 2010 NICE clinical guideline 92)*

3.2 Risk of bleeding and contraindications to thromboprohylaxis / Low Molecular Weight Heparin?

See bleeding risk factors and contraindications guidance below. This assessment value indicates the reason why Thromboprophylaxis cannot be prescribed even when VTE risk assessment is that Thromboprophylaxis is indicated.



Please note

- VTE prophylaxis is not required in patients taking;
    - Warfarin within therapeutic range (INR > 2 with daily INR checks)
    - Direct oral anticoagulants (DOACS) – Apixaban, Dabigatran, Edoxaban and Rivaroxaban
- If anticoagulation is interrupted, (or INR less than 2), VTE prophylaxis should be assessed and prescribed as above
- VTE prophylaxis is required in patients taking antiplatelet agents. These patients should be assessed as above
- For patients expected to receive spinal anaesthesia, please discuss the timings of anticoagulation (LMWH) with a consultant anaesthetist.

4. GENERAL RECOMMENDATIONS FOR THROMBOPROPHYLAXIS

Thromboprophylaxis should be considered in any immobilised patient age 16+ with one or more of the above risk factors. Thromboprophylaxis may be inappropriate in patients who are terminally ill.

4.1 Normal thrombophylaxis for ADULT inpatients:

Enoxaparin 40 mg once a day (subcutaneous)
Administered at 1800 hrs everyday on most wards

If Enoxaparin is contraindicated (e.g. heparin allergy), use:
Fondaparinux 2.5 mg once a day (subcutaneous)

Enoxaparin doses: The manufacturers do not suggest that dose adjustment is required for patients at extremes of body weight, but recent guidance suggests that you may wish to consider adjusting the doses to allow for these extremes. This decision is at the discretion of the consultant responsible for the care of the patient, and further advice can be sought from your ward pharmacists.
The suggested doses from recent literature are as follows[2]:

Bodyweight	Enoxaparin dose
< 50 kg	20 mg OD*
51 – 100 kg	40 mg OD
101 – 150 kg	40 mg BD*
>150 kg	60 mg BD*

* Unlicensed doses

Consider dose reduction if eGFR or raised blood creatinine levels indicate renal insufficiency.

Renal failure (accumulation, enhanced anticoagulant effect);

- *eGFR > 30 ml/min – no dose adjustment required.*
- *eGFR – 15 to 30 ml/min – halve dose of enoxaparin for prophylaxis of DVT.*
- *eGFR <15 ml/min –Use Unfractionated subcutaneous Heparin 5000 units BD.*
- *AKI stage 2 or 3 (as indicated in blood chemistry results under AKI warning) use Unfractionated subcutaneous Heparin 5000 units BD.*

Treatment should continue until patient fully mobile (licensed for 14 days maximum). In cases where the duration is likely exceed 14 days, patients should be reviewed and their risk factors considered prior to the continuation of Enoxaparin. If performing epidural or spinal anaesthesia, lumbar puncture or epidural catheter removal, more than 12 hours should have lapsed since the last dose of enoxaparin (please discuss with the consultant anaesthetist for more detailed guidance).

Cautions with Enoxaparin (seek senior pharmacist/haematologist advice):

- Avoid enoxaparin in acute stroke patients, unless very high risk for DVT / PE and cerebral haemorrhage has been excluded (consultant decision). VTE prophylaxis requirements will be assessed on an individual patient basis by the specialist stroke physicians
- Pregnancy (see obstetrics and gynaecology guidelines: http://bhftintranet.burtonft.nhs.uk/Departments/womens-services/obstetrics/VTE%20Prophylaxis.pdf)
- Monitor platelet count before commencing enoxaparin and regularly thereafter. If platelet count decreases to below 75, withhold enoxaparin and seek urgent haematological advice
  - *Enoxaparin to be given only on consultant discretion if platelet count <75.*

4.2 General measures

- **Knee-length anti-embolism stockings**
  - All patients in surgery, gynaecology and orthopaedic wards – unless contraindicated (see below)
  - Mechanical methods of prophylaxis have not to date been appropriately evaluated in acutely ill medical patients, and thus are not recommended at present. Knee-length anti-embolism stockings when used should be properly measured and fitted

Contraindications to anti-embolism stockings[1]

- 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 manufacturer.
- Cardiac failure
- Severe leg oedema or pulmonary oedema from congestive heart failure
- Unusual leg size or shape or major limb deformity preventing correct fit.
- Acute stroke patients

- **Encourage mobilisation** (when appropriate)

- Do not allow patients to become dehydrated unless clinically indicated.

4.3 Additional guidance in specialist areas

These are in addition to the surgical risk factors in section 3.1.

i. Surgical Patients

- Patients who have undergone major cancer surgery of the abdomen or pelvis should receive Enoxaparin 40 mg Daily for a total of 28 days after the surgery
- Patients will require their renal function monitoring pre-discharge and 2-3 weeks following discharge.

ii. Orthopaedic patients

- Patients undergoing elective hip and knee replacements require extended post-op VTE prophylaxis. The options available should be offered to all patients

  Hip replacement

  1. LMWH for 10 days followed by aspirin (75 or 150 mg) for a further 28 days
  2. LMWH for 28 days combined with anti-embolism stockings (until discharge)
  3. Rivaroxaban 10 mg daily for 35 days as per NICE TG170 and product marketing authorisation.

  Knee replacement

  1. Aspirin (75 or 150 mg) for 14 days
  2. LMWH for 14 days combined with anti-embolism stockings until discharge
  3. Rivaroxaban 10 mg daily for 14 days as per NICE TG170 and product marketing authorisation.

- Foot and ankle surgery
  Consider pharmacological VTE prophylaxis as per section 4.1 for up to 42 days in patients who require immobilisation. Consider stopping if immobilisation continues beyond 42 days.

- Fragility Fractures
  Patients who have suffered fragility fractures of the hip, proximal femur or pelvis should be offered VTE prophylaxis for 1 month (28 days) as per section 4.1. This should be started before surgery, with the last dose of Enoxaparin at least 12 hours prior to surgery. Please note, DOACS are NOT licensed for this indication, so the options in section 4.1 must be used.

- Lower limb immobilisation
  Pharmalogical prophylaxis with LMWH or Fondaparinux should be considered in patients with lower limb immobilisation where the risk

of VTE outweighs the risk of bleeding. Consider stopping this prophylaxis if immobilisation continues beyond 6 weeks (42 days)

iii. Gynaecology patients

- Patients who have undergone major cancer surgery of the abdomen or pelvis should receive VTE prophylaxis as per section 4.1 for 28 days total after the surgery
- Patients with a BMI > 35 should be prescribed VTE prophylaxis as per section 4.1 for 5-7 days post-operatively at the discretion of the consultant.

5 LOCAL OBSTETRICS GUIDELINES

See obstetric VTE management policy (link below)

http://bhftintranet.burtonft.nhs.uk/Departments/womens-services/obstetrics/VTE%20Prophylaxis.pdf

6. DISCHARGE

All discharged patients who have anticoagulation prescribed should have the anticoagulation checklist completed (available on the haematology home page). One copy should be given to the patient, and one faxed to the GP.

Information relating to the indication, duration and dose of anticoagulation MUST be included in the discharge letter.

6.1 Discharge to HOME

All adult patients MUST be provided with an appropriate patient information leaflet advising on the VTE risk which is verbally discussed prior to discharge.

It should be ensured that patients discharged with anti-embolism stockings understand the importance of wearing these stockings and how to wear them correctly. Daily removal for hygiene purposes and how to remove them and when to stop wearing them.

Patients being discharged on extended prophylaxis with enoxaparin will receive appropriate training for self-administration of the injections, or a referral for the district nurse to administer the drug.

They will also be supplied with an appropriate sharps box for disposal of the syringes.

All patients should be advised who/where to contact if there are any problems and information provided to the GP regarding any VTE prophylaxis supplied.

6.2 Transfer to Community Hospital, Step down or Intermediate care:

ALL patients should undergo VTE risk assessment and continue with prescribed low molecular weight heparin until risk factors resolved.

Where patients have been prescribed extended VTE prophylaxis as above, **it is essential** that on discharge this is continued for the required amount of time.
The doctor prescribing the drug is responsible for ensuring there is an accurate stop date on the prescription.

Patients requiring Rivaroxaban following elective Hip or Knee replacements should be issued with a relevant TTO pack prior to discharge to the community hospitals.

6.3 Transfer to Acute Hospital

Other acute hospitals should follow their own VTE risk assessment and Thromboprophylaxis policy for all admissions.

7. PROCEDURE TO FOLLOW IF VENOUS THROMBO-EMBOLISM SUSPECTED AND MANAGEMENT OF A POSITIVE DIAGNOSIS

The NICE guideline (CG144): Venous thromboembolic diseases: the management of venous thromboembolic diseases should be followed.

8. ORGANISATIONS EXPECTATIONS IN RELATION TO STAFF TRAINING

All nursing, midwifery and medical staff new to the Trust are required to undertake training on the EPR system relevant to their role. Access to EPR is authorised once attendance at the training has been completed.

The EPR training includes a session on the use of the nursing assessment tools as relevant to role and to the risk assessments including VTE tools for all medical and nursing staff.

9. CLINICAL AUDIT STANDARDS DERIVED FOR THROMBO-EMBOLIC PROPHYLAXIS

- All adult inpatients should be assessed for their risk of VTE on admission to hospital
- Patients with risk factors for VTE should receive an appropriate dose of Enoxaparin daily unless contraindicated
- Information is collated daily for each patient from V6 to monitor compliance with VTE risk assessment and this is reported into the Unify Database and also to the Clinical Commissioning Group.

There is a monthly audit of compliance as part of the Safety Thermometer of VTE Risk Assessment and Thromboprophylaxis. The data collected is reported internally.

10. REFERENCES/ SOURCE DOCUMENTS

1. National Institute for Health and Clinical Excellence. Reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in inpatients undergoing surgery. NICE clinical guideline No. 92.

2. What doses of thromboprophylaxis are appropriate for adult patients at extremes of body weight?
   Prepared by the HAT Committee of the UK Clinical Pharmacy Association for NHS healthcare professionals: Date Prepared: June 2015

3. SPC for Enoxaparin: http://www.medicines.org.uk/emc/medicine/24345 (accessed 7/9/16).

11. GLOSSARY

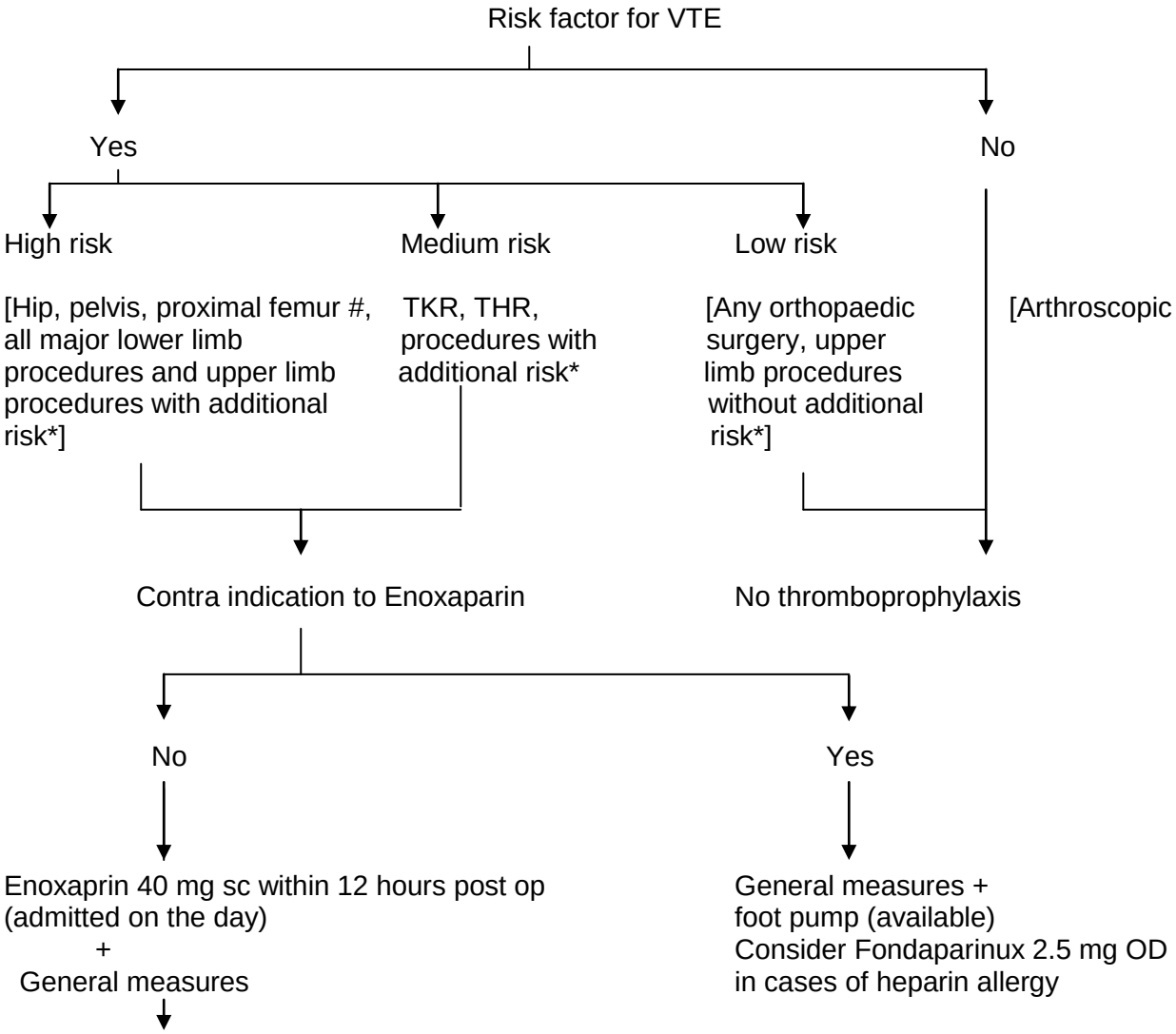
DVT	Deep vein thrombosis
HRT	Hormone replacement therapy
THR	Total hip replacement
TKR	Total knee replacement
VTE	Venous thromboembolism

APPENDIX 1

FLOW CHART 1

THROMBOPROPHYLAXIS FOR ORTHOPAEDIC PATIENTS

All orthopaedic patients (acute and elective)



Continue until patient is fully mobile/discharged **

** See section 4.3 for VTE requirements in orthopaedic patients.

Enoxaparin dose to be adjusted for weight / renal function as advised in section 5.1

* *see list of risk factors in the guidelines*

APPENDIX 2

INTERACTIONS WITH OTHER MEDICATIONS THAT MAY AFFECT THE EFFICACY OF THROMBOPROPHYLAXIS OR INCREASE BLEEDING RISK:

The SPC for **Enoxaparin** states:

It is recommended that agents which affect haemostasis should be discontinued prior to enoxaparin therapy unless their use is essential, such as: **systemic salicylates, acetylsalicylic acid, NSAIDs including ketorolac, dextran, and clopidogrel, systemic glucocorticoids, thrombolytics and anticoagulants.** If the combination cannot be avoided, enoxaparin should be used with careful clinical and laboratory monitoring.

The SPC for Rivaroxaban states:

The use of Rivroxaban is not recommended in patients receiving systemic treatment with CYP3A4 inhibitors (azole-antimycotics such as ketoconazole, itraconazole, voriconazole and posaconazole or HIV protease inhibitors) as this may increase the bleeding risk. The interaction with other CYP3A4 inhibitors (e.g. Clarithromycin, Erythromycin and Fluconazole) is not considered to be clinically relevant except in renal impairment.

Concomitant administration of Rivaroxaban with strong CYP3A4 inducers e.g rifampicin, phenytoin, carbamazepine, phenobarbital or St. John's Wort should be done with caution as this may lead to reduced Rivaroxaban plasma concentration. This should be avoided unless the patient is closely observed for signs and symptoms of thrombosis.

Care is to be taken if patients are treated concomitantly with any other anticoagulants due to the increased bleeding risk. Care is also to be taken if patients are treated concomitantly with NSAIDs (including acetylsalicylic acid) and platelet aggregation inhibitors because these products typically increase the bleeding risk.

Contact Pharmacy Dept on ext 5168 for further advice.