The Trust’s Intranet holds the current approved guidance documents.

Notice to staff using a paper copy of this document.
Staff must ensure that they are using the most up-to-date document to guide their practice and must check that the version number of the paper copy matches that of the one on the Intranet.
# Document History

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<th>Date</th>
<th>Actioned by</th>
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<td>Venous thromboembolic disease management guideline</td>
<td>September 2012</td>
<td>Clinical Specialist in Clinical Audit &amp; Effectiveness</td>
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<td>Venous thromboembolic disease management guideline</td>
<td>October 2012</td>
<td>Clinical Practices Group</td>
<td>Whole document</td>
<td>Approved and ratified by the group.</td>
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1. Introduction

Venous thromboembolism (VTE) is a condition in which a blood clot (a thrombus) forms in a vein, most commonly in the deep veins of the legs or pelvis. This is known as deep vein thrombosis, or DVT. The thrombus can dislodge and travel in the blood, particularly to the pulmonary arteries. This is known as pulmonary embolism, or PE. The term ‘VTE’ includes both DVT and PE.

Venous thromboembolic diseases cover a spectrum ranging from asymptomatic calf vein thrombosis to symptomatic DVT. They can be fatal if they lead to PE, in which the blood supply to the lungs can be obstructed by the thrombus. Non-fatal VTE can cause serious long-term conditions such as post-thrombotic syndrome.

Thrombophilia is a major risk factor for VTE. It is an inherited or acquired prothrombotic state that predisposes to VTE. Other major risk factors for VTE include; a history of DVT, age over 60 years, surgery, obesity, prolonged travel, acute medical illness, cancer, immobility and pregnancy.

Failure to diagnose and treat VTE correctly can result in fatal PE. However, diagnosis of VTE is not always straightforward. This guideline includes advice on the Wells score, D-dimer measurement, ultrasound and radiological imaging. It also offers guidance on the management of VTE, investigations for cancer in patients with VTE and thrombophilia testing. The guideline covers adults with suspected or confirmed DVT or PE. It does not cover children or young people aged under 18, or women who are pregnant refer to the Trust’s Therapeutic Anticoagulation in Pregnancy, Labour and Post Delivery Guideline (SWH 00259).

2. Purpose

The purpose of this guideline is to provide guidance for all staff employed by South Warwickshire NHS Foundation Trust (hereby known as ‘The Trust’) on the management of suspected and confirmed thromboembolic disease. This guideline aims to ensure that healthcare professionals can recognise patients at risk of thromboembolic disease and take appropriate steps to manage the condition.

3. Audience

All staff involved in the diagnosis and care of patients with suspected and confirmed venous thromboembolic diseases.

4. Associated Documents

<table>
<thead>
<tr>
<th>Document</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>SWH 00253</td>
<td>Anticoagulant Guidelines</td>
</tr>
<tr>
<td>SWH 00259</td>
<td>Therapeutic Anticoagulation in Pregnancy, Labour and Post Delivery Guideline</td>
</tr>
</tbody>
</table>
5. Responsibilities / Duties

5.1 Board of Directors (BoD)
The BoD is responsible for determining the governance arrangements of the Trust including effective risk management processes. It is responsible for ensuring that the necessary clinical policies, procedures and guidelines are in place to safeguard patients and reduce risk. In addition they will require assurance that clinical policies, procedures and guidelines are being implemented and monitored for effectiveness and compliance.

5.2 Chief Executive
The Chief Executive (CEO) has overall responsibility for patient safety and ensuring that there are effective risk management processes within the Trust which meet all statutory requirements and adhere to guidance issued by the Department of Health.

The CEO holds each line manager accountable for meeting objectives and to work together towards meeting the objectives approved by the Board.

5.3 Director of Nursing and Medical Director
The Director of Nursing is the Executive with delegated responsibility for implementation of Governance arrangements within the Trust.

The Director of Nursing and the Medical Director are responsible for overseeing the implementation of this document.

5.4 Line Managers
Line Managers are responsible for ensuring that this document is made available to all staff within their department, and that staff implement and comply with this document on a daily basis when managing patients with possible venous thromboembolic disease.

Line Managers must also ensure that staff who are involved in the care of patients with suspected venous thromboembolic disease are trained and competent to comply with this document.

5.5 All Clinical Staff
All clinical staff involved in the management of patients with a suspected or confirmed diagnosis of venous thromboembolism are responsible for complying with this document.

6. Management of Venous Thromboembolic (VTE) disease
Venous thromboembolism may be ‘provoked’ or ‘unprovoked’.

‘Provoked’ VTE is where the patient has an antecedent (within 3 months) and transient major clinical risk factor(s) for VTE – for example surgery, trauma, significant immobility (bed bound, unable to walk unaided or likely to spend a substantial proportion of the day in bed or in a chair), pregnancy or puerperium, or in a patient who is having hormonal therapy (oral contraceptive or hormone replacement therapy).
‘Unprovoked’ VTE is where there is no antecedent major clinical risk factor or the patient has active cancer, thrombophilia or a family history of VTE because these are underlying risks that remain constant in the patient.

### 6.1 Suspected Deep Venous Thrombosis (DVT)

If a patient presents with signs or symptoms of deep vein thrombosis (DVT), carry out an assessment of their general medical history and a physical examination to exclude other causes.

Carry out a two-level DVT Wells score in patients where DVT is suspected (for the two-level DVT Wells score see Appendix A) and a D-dimer test.

An algorithm of the diagnosis of DVT, as described below, is shown in Appendix B.

#### 6.1.1 DVT Likely According to Two Level Wells Score

For patients whose Wells score is 2 or more points (= DVT likely) and the D-dimer is also positive, low molecular weight heparin (LMWH) should be commenced in a therapeutic dose. Tinzaparin is the LMWH of choice in this Trust. The weight adjusted dose of tinzaparin is shown on the front of the Trust’s anticoagulant chart (see Appendix C). These patients should then have a proximal leg vein ultrasound scan to confirm the diagnosis. If this scan is positive, warfarin is commenced; the tinzaparin is continued for a minimum of 5 days and at least until the INR is within the therapeutic range.

Where the Wells score is 2 or more (= DVT likely) but the D-dimer is negative, a proximal leg vein ultrasound scan should be arranged.

- If the scan is positive, DVT has been confirmed and tinzaparin plus warfarin must be commenced
- If the scan is negative, DVT has been ruled out but if the symptoms persist a 2nd scan should be carried out after 7 days

#### 6.1.2 DVT Unlikely According to Two Level Wells Score

For patients whose Wells score is 0 or 1 point (= DVT unlikely) and D-dimer negative, DVT has been ruled out and another diagnosis should be considered.

Where the Wells score is 0 or 1 point (= DVT unlikely) and the D-dimer is positive, a proximal leg vein ultrasound scan should be arranged. If the scan is negative but symptoms suggesting DVT persist, a second ultrasound scan should be carried out 7 days later. If the first ultrasound scan is positive, DVT has been confirmed and the patient should be commenced on LMWH (tinzaparin) according to the front page of the anticoagulant chart (see Appendix C).

### 6.2 Treatment of DVT

The initial management of DVT is a minimum of 5 days of therapeutic dose of LMWH. Tinzaparin is the LMWH used in this Trust. The dose is weight adjusted; there is a guide on the front of the anticoagulant chart (see Appendix C) and pre-filled syringes of
tinzaparin are used. Once the DVT has been confirmed by a proximal leg vein ultrasound scan, warfarin should be commenced. The patients must be referred to the DVT / Anticoagulant Clinic where management of their treatment will be continued.

The length of treatment of DVT will depend whether it is an above or below knee DVT and whether it is provoked, unprovoked and/or recurrent. Existing guidelines are on page 3 of the Anticoagulant Chart (Appendix C).

If warfarin is contraindicated or the patient requires long-term LMWH, rivaroxaban (one of the new oral anticoagulants) may be considered; rivaroxaban has been approved by NICE (2012) for this indication.

6.3 Suspected Pulmonary Embolism (PE)

If a patient presents with signs or symptoms of pulmonary embolism (PE), carry out an assessment of their general medical history and a physical examination to exclude other causes.

Carry out a two-level PE Wells score in patients where PE is suspected (for the two-level PE Wells score see Appendix D) and a D-dimer test.

An algorithm of the diagnosis of PE, as described below, is shown in Appendix E.

6.3.1 PE Likely According to Two Level Wells Score

For patients whose Wells score more than 4 points (= PE likely) and the D-dimer is also positive, low molecular weight heparin (LMWH) should be commenced in a therapeutic dose. Tinzaparin is the LMWH of choice in this Trust. The weight adjusted dose of tinzaparin is shown on the front of the Trust’s anticoagulant chart (see Appendix C) and tinzaparin is available in pre-filled syringes. These patients should then have CT pulmonary angiography (CTPA) or VQ scan to confirm the diagnosis. If either scan is positive, warfarin is commenced; the tinzaparin is continued for a minimum of 5 days and at least until the INR is within the therapeutic range.

If the CTPA or VQ scan is negative, the patient does not have a PE and another diagnosis should be considered. The patient should be informed that the diagnosis of PE has been ruled out. The LMWH can be stopped.

6.3.2 PE Unlikely According to Two level Wells Score

For patients whose Wells score is 4 points or less (= PE unlikely) and D-dimer negative, PE has been ruled out. The patient must be informed that it is not likely that they have had a PE; the signs and symptoms of PE must be discussed and when and where they should seek further medical help. An alternative diagnosis should be considered.

Where the Wells score is 4 points or less (= PE unlikely) and the D-dimer is positive, a CTPA or VQ scan should be arranged. LMWH (tinzaparin) should be commenced until the result of the scan is known. If the scan is negative the patient must be informed that it is not likely that they have had a PE; the signs and symptoms of PE must be discussed and
when and where they should seek further medical help. An alternative diagnosis should be considered. If the CT pulmonary angiogram scan or VQ scan is positive, PE has been confirmed and the patient should be commenced on LMWH (tinzaparin) according to the front page of the anticoagulant chart (see Appendix C).

6.4 Treatment of PE

The initial management of PE is a minimum of 5 days of therapeutic dose of LMWH. Tinzaparin is the LMWH used in this Trust. The dose is weight adjusted; there is a guide on the front of the anticoagulant chart (see Appendix C) and pre-filled syringes of tinzaparin are used. Once the PE has been confirmed by a CTPA or VQ scan, warfarin should be commenced. The patients must be referred to the DVT / Anticoagulant Clinic where management of their treatment will be continued.

The length of treatment of PE will depend whether it is ‘provoked’, ‘unprovoked’ and/or recurrent. Existing guidelines are on page 3 of the Anticoagulant Chart (Appendix C).

7. Investigations for Cancer

Patients diagnosed with unprovoked DVT or PE who are not already known to have cancer should have some additional basic investigations if judged to be clinically justified which include:

- Physical examination (guided by the patient’s history)
- Chest X-ray
- Blood tests (full blood count, serum calcium and liver function tests)
- Urinalysis

Further investigations should be discussed with the consultant in charge of the patient but may include abdomino-pelvic CT scan (and referral to the Breast Clinic in women) in patients over 40 years who have presented with an unprovoked DVT and the investigations above have proved negative.

8. Thrombophilia

Thrombophilia is a major risk factor for VTE. It is an inherited or acquired prothrombotic state that predisposes to VTE.

8.1 Thrombophilia Testing

Do not offer thrombophilia testing to patients while they are on anticoagulation treatment.

Routine screening should be carried out after patients have been off anticoagulants for at least one month. Pregnancy, combined oral contraceptive pill and hormone replacement therapy can also affect results – testing should be avoided in these situations unless there is clinical urgency (discuss with haematologist / obstetrician).
8.1.1 Unprovoked DVT
Consider testing for antiphospholipid antibodies in patients who have had unprovoked DVT or PE if it is planned to stop anticoagulation treatment.

Consider testing for hereditary thrombophilia in patients who have had unprovoked DVT or PE and who have a first-degree relative who has had DVT or PE if it is planned to stop anticoagulation treatment.

8.1.2 Provoked DVT
Do not offer thrombophilia testing to patients who have had provoked DVT or PE.

Do not routinely offer thrombophilia testing to first-degree relatives of people with a history of DVT or PE and thrombophilia.

9. Monitoring Compliance
The Consultant Haematologist will ensure that the processes set out in this document are audited at least once a year. The Audit results will be fed back via Thrombosis Committee and the appropriate Audit and Operational Governance Groups. Where monitoring has identified deficiencies, recommendations and an action plan will be developed to improve compliance with the document. See Appendix F for specific details.

10. Author(s)
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Ruth Brown  Clinical Specialist in Clinical Audit and Effectiveness

11. Contributors
Members of Haemostasis & Thrombosis Committee

12. Equality Impact Assessment Tool
Has an Equality Impact Assessment been carried out?  YES
Preliminary Stage 1 Equality Impact Assessment (must be completed if required*)
What date was Stage 1 completed and published?  September 2012
Has a Full Assessment Stage 2 Equality Impact Assessment Tool been undertaken*?  N0-N/A
If yes, what was the date of assessment and publication of Stage 2 and action plan?  N/A
### 13. References

- National Institute for Health and Clinical Excellence (2012) Venous thromboembolic diseases NICE clinical guideline CG 144
- South Warwickshire NHS Foundation Trust (2012) SWH 00253 Anticoagulant Guidelines

### 14. Appendices

<table>
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<td>Two level DVT Wells Score</td>
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<tr>
<td>Appendix B</td>
<td>Algorithm for diagnosis of DVT</td>
</tr>
<tr>
<td>Appendix C</td>
<td>SWFT Anticoagulation Chart and Referral Form</td>
</tr>
<tr>
<td>Appendix D</td>
<td>Algorithm for diagnosis of PE</td>
</tr>
<tr>
<td>Appendix E</td>
<td>Two level PE Wells score</td>
</tr>
<tr>
<td>Appendix F</td>
<td>Monitoring compliance form</td>
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</tbody>
</table>
### Appendix A – Two Level DVT Wells Score

<table>
<thead>
<tr>
<th>Clinical feature</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active cancer (treatment ongoing, within 6 months, or palliative)</td>
<td>1</td>
</tr>
<tr>
<td>Paralysis, paresis or recent plaster immobilisation of the lower extremities</td>
<td>1</td>
</tr>
<tr>
<td>Recently bedridden for 3 days or more or major surgery within 12 weeks requiring general or regional anaesthesia</td>
<td>1</td>
</tr>
<tr>
<td>Localised tenderness along the distribution of the deep venous system</td>
<td>1</td>
</tr>
<tr>
<td>Entire leg swollen</td>
<td>1</td>
</tr>
<tr>
<td>Calf swelling at least 3 cm larger than asymptomatic side</td>
<td>1</td>
</tr>
<tr>
<td>Pitting oedema confined to the symptomatic leg</td>
<td>1</td>
</tr>
<tr>
<td>Collateral superficial veins (non-varicose)</td>
<td>1</td>
</tr>
<tr>
<td>Previously documented DVT</td>
<td>1</td>
</tr>
<tr>
<td>An alternative diagnosis is at least as likely as DVT</td>
<td>−2</td>
</tr>
</tbody>
</table>

#### Clinical probability simplified score

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<thead>
<tr>
<th></th>
<th>2 points or more</th>
<th>1 point or less</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVT likely</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DVT unlikely</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Appendix B - Algorithm for Diagnosis of DVT

Patient with signs or symptoms of DVT

Other causes excluded by assessment of general medical history and physical examination

DVT suspected

Two level DVT Wells score

DVT likely (≥ 2 points)

D-dimer test (≥ 0.5 warrants further investigation)

+ ve

Commence low molecular weight heparin (LMWH) as per anticoagulant chart

- ve

Proximal leg vein ultrasound scan

DVT Confirmed. Commence LMWH & start warfarin

+ ve

DVT unlikely (≤ 1 point)

D-dimer test (≥ 0.5 warrants further investigation)

+ ve

Proximal leg vein ultrasound scan

NO DVT Consider other diagnosis

- ve

Proximal leg vein ultrasound scan

NO DVT If symptoms persist repeat ultrasound in 7 days

- ve

NO DVT

If symptoms persist repeat ultrasound in 7 days
Appendix C – Trust Anticoagulant Chart and Referral Form

Guidelines for anticoagulation of adult patients

Lower doses may be required for:
1) the elderly, especially those with cardiac failure and
2) patients with hepatic and/or severe renal failure.

Reason for anticoagulation

NEW TREATMENT   CONTINUING TREATMENT   Monitored by: GP / Hospital

Subcutaneous low molecular weight heparin (LMWH) schedule

Recommended treatment for patients with DVT or PE in the absence of pregnancy (caution in asthma). Note: presence of sodium metabolite may (especially in patients with asthma) lead to hypersensitivity with benzyl alcohol and shock.

Pre-filled syringes of tinzaparin must be used in pregnancy. Vials of tinzaparin contain benzyl alcohol which must be avoided in pregnancy.

Body weight

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>160</td>
<td>1.45</td>
</tr>
<tr>
<td>155</td>
<td>1.40</td>
</tr>
<tr>
<td>150</td>
<td>1.35</td>
</tr>
<tr>
<td>145</td>
<td>1.30</td>
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<td>140</td>
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<td>45</td>
<td>0.40</td>
</tr>
<tr>
<td>40</td>
<td>0.35</td>
</tr>
</tbody>
</table>

Estimated creatinine clearance*

*Estimated creatinine clearance can be calculated using the Cockcroft-Gault formula. Visit the Nottingham University Anticoagulation website [http://www.nruh.nhs.uk/ntntAnticoagulation/] and select "Creatinine clearance calculator"*

Once daily S/C injection based on bodyweight

APTT monitoring is not required.

Treatment with LMWH must continue for at least 8 days. Thereafter, it should not be stopped until the INR is stable and within the appropriate therapeutic range 2.0 - 3.0 or 3.0 - 4.0 (see page 3).

Where patients are in renal failure (creatinine clearance < 30 mL/min), it is essential to discuss anticoagulant management with a consultant haematologist. Determination of creatinine clearance must not delay or modify administration of the first dose.

Monitor platelets after four days of low molecular weight heparin.
**Warfarin Schedule**

- **DVT and/or PE:** Start warfarin on same day as heparin (includes LMWH) if diagnosis confirmed.
- **AF** new diagnoses - 3mg daily for 2 days, check INR after 2nd dose.

**Warfarin dosing:**

- Adults up to 75 years (excluding pregnant women): prescribe 5mg daily for 2 days, then check the INR after the second dose and adjust dose accordingly.
- Patients aged over 75 years: prescribe 3mg daily, for 2 days, checking the INR after the second dose and adjust dose accordingly.

**Drug interactions with warfarin:**

- **Drugs which increase the anticoagulant effect include:**
  - Aspirin, NSAIDS, paracetamol (regular use)
  - Antibiotics (e.g. clindamycin, metronidazole, clofloxacin)
  - Antifungals (e.g. tioconazole)
  - Anti-epileptics (e.g. carbamazepine, rifampicin, Vitamin K)

- **Drugs which reduce the anticoagulant effect include:**
  - Garlic (increases anticoagulant effect)
  - Ginseng (reduces anticoagulant effect)
  - Glucosamine (increases anticoagulant effect)
  - St John's Wort (reduces anticoagulant effect)

**Bleeding whilst anticoagulated (Heparin infusion)**

- Heparin is currently the most effective intravenous anticoagulant but it can cause bleeding. Reducing dose may be necessary.

**Bleeding whilst anticoagulated (LMWH)**

- Low molecular weight heparin is an effective alternative to warfarin, but it can also cause bleeding. Reducing dose may be necessary.

**Bleeding or over-anticoagulated (Warfarin)**

- **Major bleeding (e.g. intracranial haemorrhage):**
  - Stop warfarin and start blood product for INR.
  - 5mg vitamin K (phosphonate) by slow intravenous injection.
  - OCTAPLEX for intravenous unfractionated heparin (if available). Give probenecid 500mg with each dose and limit to 6 doses/day to avoid bleeding.

- **Initial INR:**
  - 2 - 2.5
  - 2.6 - 3.0
  - 3.1 - 3.5
  - >3.5

<table>
<thead>
<tr>
<th>mL</th>
<th>2 - 2.5</th>
<th>2.6 - 3.0</th>
<th>3.1 - 3.5</th>
<th>&gt;3.5</th>
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</thead>
<tbody>
<tr>
<td>1.0</td>
<td>1.1</td>
<td>1.4</td>
<td>1.7</td>
<td>1.9</td>
</tr>
</tbody>
</table>

- **Non life-threatening bleeding:**

  - Stop warfarin.
  - 5mg vitamin K (phosphonate) by slow intravenous injection.
  - TFT (Controlled)

- **INR 2.0 - 2.5 with no additional risk factors:**

  - Stop warfarin.
  - 1 - 2mg vitamin K (phosphonate) by slow intravenous injection or 5mg by mouth.
  - Repeat INR in 12 days.

- **INR 2.6 - 3.5 with no additional risk factors:**

  - Stop warfarin.
  - 5mg vitamin K (phosphonate) by mouth.
  - Repeat INR in 12 days.

- **INR 3.6 - 5.0:**

  - Heparin is stopped for 1 day and reviewed.

- **INR >5.0:**

  - Heparin is stopped for 1 day and reviewed.

- **Uncontrolled bleeding at therapeutic levels:**

  - Heparin is stopped for 1 day and reviewed.
  - Repeat INR for 1 day and reviewed.

  - Heparin is stopped for 1 day and reviewed.

- **In any doubt contact Consultant Haematologist.**
# Venous Thromboembolic Disease Management Guideline

## Request for continuation of anticoagulant therapy as outpatient

A referral to the DVT / Anticoagulant Nurse Specialist should be made before the patient is discharged from hospital. This should be performed on-line. Complete this form and submit it to the nurse who is attending the patient on discharge. 

<table>
<thead>
<tr>
<th>Venous thromboembolism</th>
<th>INR</th>
<th>Recommended duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary embolus</td>
<td>2-3</td>
<td>26 weeks</td>
</tr>
<tr>
<td>Proximal deep vein thrombosis</td>
<td>2-3</td>
<td>26 weeks</td>
</tr>
<tr>
<td>Postoperative calf vein thrombosis without any risk factors</td>
<td>2-3</td>
<td>6 weeks</td>
</tr>
<tr>
<td>calf vein thrombosis in non-surgical patients without any risk factors</td>
<td>2-3</td>
<td>13 weeks</td>
</tr>
<tr>
<td>calf vein thrombosis in non-surgical patients with risk factors</td>
<td>2-3</td>
<td>indefinite (while risk factors persist)</td>
</tr>
<tr>
<td>Recurrent DVT and/or PE</td>
<td>2-3</td>
<td>indefinite</td>
</tr>
<tr>
<td>Recurrent DVT and/or PE while on warfarin (INR range 2-3)</td>
<td>2-4</td>
<td>indefinite</td>
</tr>
</tbody>
</table>

## Thrombophilia

- Symptomatic inherited thrombophilia: 2-3 indefinite

## Antiphospholipid syndrome

- Antiphospholipid syndrome: 2-3 indefinite

## Atrial Fibrillation

- Non-thrombotic atrial fibrillation: 2-3 indefinite
- Atrial fibrillation or other high risk arrhythmias: 2-3 indefinite

## Heart valve prostheses & other cardiac indications

- Cardiomyopathy: 2-3 indefinite
- Cardiomyopathy, mural thrombus or atheroma: 2-3 indefinite
- Mechanical prosthetic valves (older valves: caged ball or tilting disc, Starr-Edwards, Björk): 3-4 indefinite
- (newer valves - tilting disk): 2-3 indefinite
- Bioprosthetic heart valves (not atrial): 2-3 3 months
- Rheumatic mitral valve disease: 2-3 indefinite

## Pregnancy: discuss with obstetrician or haematologist

- Discontinue warfarin if there is severe pre eclampsia. If there is an AF, intra cardiac thrombus or history of systemic embolism.

## Aspirin is first line therapy for the following conditions. However, warfarin is considered appropriate:

- TIAs / Ischaemic stroke: 2-3 indefinite
- Peripheral arterial thrombosis and grafts: 2-3 indefinite
- Coronary artery thrombosis: 2-3 indefinite
- Coronary artery graft thrombosis: 2-3 indefinite

## Preferred treatment end date for anticoagulation

Other drug therapy

- Yellow anticoagulant book, card and information issued to patient: YES / NO
- Risks and benefits discussed with patient: YES / NO
- I can confirm that this information has been supplied and that the patient understands the clinical issues: YES / NO
- On-line referral to DVT / Anticoagulant Nurses: YES / NO

Signature of referring Doctor / Specialist Nurse

PRINT NAME

Registration number

DATE
### Results, prescription and administration record

<table>
<thead>
<tr>
<th>Date</th>
<th>Time of test</th>
<th>APTT ratio</th>
<th>IV Heparin dose per 12h (UNITS)</th>
<th>LMWH dose per 24h (ML)</th>
<th>INR</th>
<th>Warfarin dose per 24h (mg)</th>
<th>Time given</th>
<th>Administered by</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

**Heparin infusion schedule**
- IV bolus: 5,000 units
- IV infusion: 15,000 units/12 hours
- Check APTT after 2-6 hours
- Acceptable range: 1.5-2.5 (in pregnancy 1.5-2.0)

**Adjust heparin as follows**:
- If APTT > 5.0:
  - Step for 1 hour and then:
    - 4.1-5.0: decrease by 6,000 units/12 hours
    - 3.1-4.0: decrease by 4,000 units/12 hours
    - 2.1-3.0: decrease by 2,000 units/12 hours
    - 1.5-2.5: no change
    - 1.2-1.4: increase by 2,000 units/12 hours
    - <1.2: increase by 4,000 units/12 hours
- Continue heparin until oral anticoagulation is established (if indicated) and the INR is stable in the appropriate therapeutic range.

**Monitor platelets after four days of heparin**

---

*Check APTT 2-6 hours after starting heparin*

*Do not re-preserve heparin for more than 24 hours*

*Checking APTT on a daily basis is the mandatory minimum for all patients receiving intravenous heparin*

*See protocol for guidance on correction of over-anticoagulation*

*For further information please contact Consultant Haematologist*
### Appendix D - Two Level PE Wells Score

<table>
<thead>
<tr>
<th>Clinical feature</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical signs and symptoms of DVT (minimum of leg swelling and pain with palpation of the deep veins)</td>
<td>3</td>
</tr>
<tr>
<td>An alternative diagnosis is less likely than PE</td>
<td>3</td>
</tr>
<tr>
<td>Heart rate &gt; 100 beats per minute</td>
<td>1.5</td>
</tr>
<tr>
<td>Immobilisation for more than 3 days or surgery in the previous 4 weeks</td>
<td>1.5</td>
</tr>
<tr>
<td>Previous DVT/PE</td>
<td>1.5</td>
</tr>
<tr>
<td>Haemoptysis</td>
<td>1</td>
</tr>
<tr>
<td>Malignancy (on treatment, treated in the last 6 months, or palliative)</td>
<td>1</td>
</tr>
</tbody>
</table>

**Clinical probability simplified score**

<table>
<thead>
<tr>
<th></th>
<th>More than 4 points</th>
<th>4 points or less</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE likely</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE unlikely</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adapted for NICE CG 144 with permission from Wells PS et al. (2000) Derivation of a simple clinical model to categorize patients’ probability of pulmonary embolism: increasing the model's utility with the SimpliRED D-dimer. Thrombosis and Haemostasis 83: 416–20
Appendix E - Algorithm for Diagnosis of PE

Patient with signs or symptoms of PE

Other causes excluded by assessment of general medical history and physical examination

PE suspected

Two level PE Wells score

PE likely (> 4 points)

D-dimer test
(≥ 0.5 warrants further investigation)

+ ve
Commence low molecular weight heparin (LMWH) as per anticoagulant chart

CTPA or VQ scan

+ ve
PE Confirmed. Commence LMWH & start warfarin

- ve
NO PE
Inform patient of symptoms and signs and when to seek medical help

PE unlikely (≤ 4 points)

D-dimer test
(≥ 0.5 warrants further investigation)

+ ve
CTPA or VQ scan

- ve
NO PE
Consider other diagnosis

CTPA or VQ scan

- ve
NO PE
Inform patient of symptoms and signs and when to seek medical help
## Appendix F – Monitoring Compliance Form

<table>
<thead>
<tr>
<th>Title of Document</th>
<th>Venous Thromboembolic Disease Management Guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>September 2012</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CQC regulations relating to this document (if any)</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHSLA Standard related to this document (if any)</td>
<td>NHSLA (2012-13) 5.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Does the document fulfil the criterion of NHSLA? (please circle as appropriate)</th>
<th>YES</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>If not, why not:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Process / minimum requirement to be monitored</th>
<th>Lead</th>
<th>Tool</th>
<th>Written Reporting Frequency</th>
<th>Written Reporting Arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management of patients with suspected DVT and/or PE. 50 – 100 cases</td>
<td>Consultant Haematologist</td>
<td>Pre-designed proforma to measure against standards in document</td>
<td>Annual</td>
<td>Thrombosis Committee and appropriate AOGGs</td>
</tr>
<tr>
<td>Management of patients with possible thrombophilia 25 – 50 cases</td>
<td>Consultant Haematologist</td>
<td>Pre-designed proforma to measure against standards in document</td>
<td>Annual</td>
<td>Thrombosis Committee and appropriate AOGGs</td>
</tr>
</tbody>
</table>

Following an audit required changes to practice will be identified and actioned within a specific time frame with a responsible person identified to lead the implementation of the actions. Lessons and action plans will be shared with all the relevant stakeholders.