Countess of Chester Hospital NHS
NHS Foundation Trust

DVT Assessment Pathway In-Hours

PATIENT NAME:

DATE OF BIRTH: **AFFIX LABEL**

CC NUMBER:

Date: _ _ / _ _ / _ _ Arrival time: _ _ : _ _ Assessment time: _ _ : _ _

Inclusion Criterion Clinical suspicion of deep venous thrombosis

Measure calf circumferences 10cm below tibial tuberosity

Left Calf Circumference = cm

Right Calf Circumference= cm

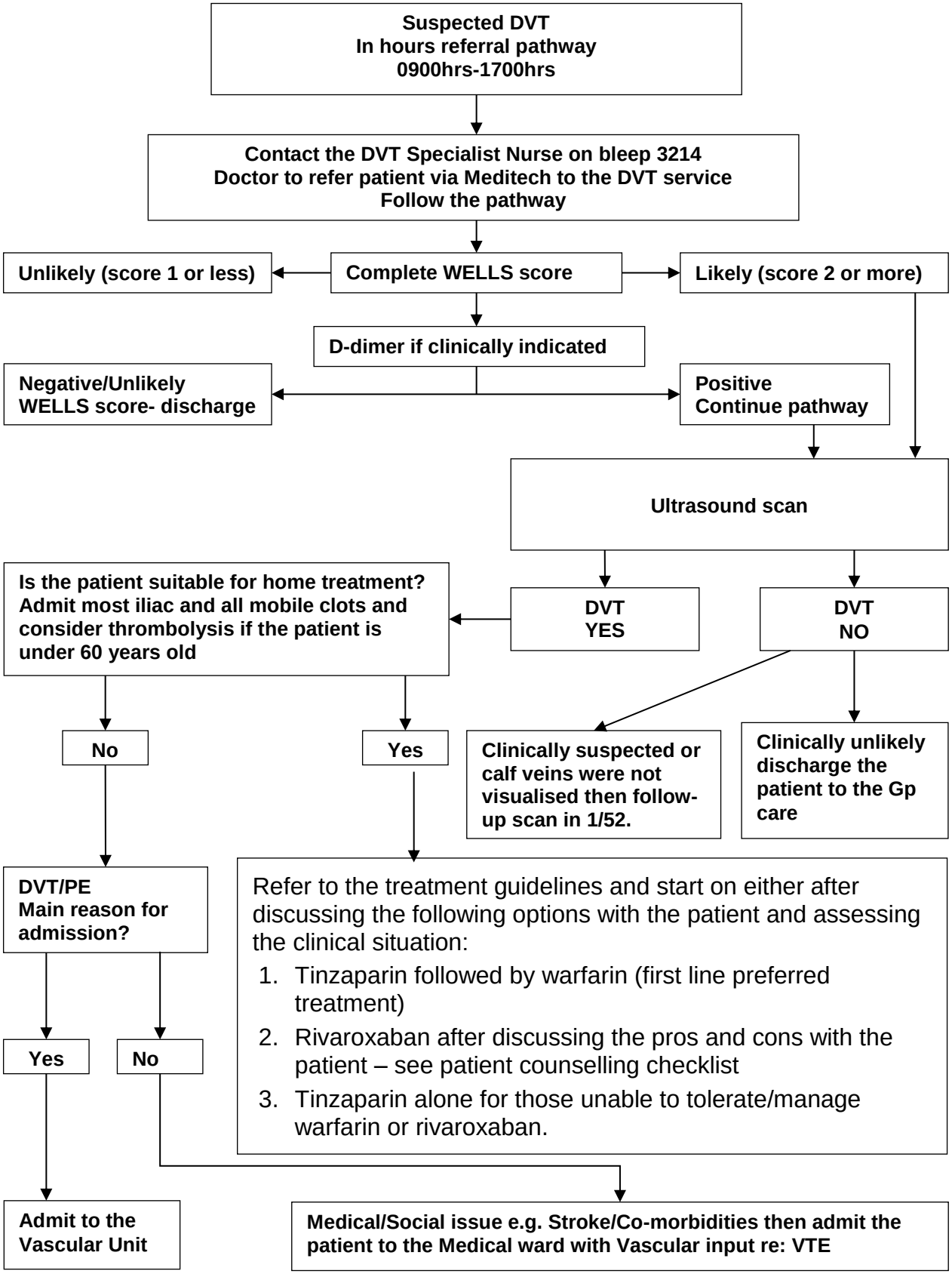
Table 1 Two-level DVT Wells score[a]

Clinical Feature	Points
Active cancer (treatment ongoing, within 6 months, or palliative)	1
Paralysis, paresis or recent plaster immobilisation of lower extremities	1
Recently bedridden for 3 days or more or major surgery within 12 weeks requiring general or regional anaesthesia	1
Localised tenderness along the distribution of the deep venous system	1
Entire leg swollen	1
Calf swelling at least 3 cm larger than asymptomatic side	1
Pitting oedema confined to the symptomatic leg	1
Collateral superficial veins (non-varicose)	1
Previously documented DVT	1
An alternative diagnosis is at least as likely as DVT	-2
Total score	
DVT likely Outcome decision Treat as outpatient or admit to Vascular unit/Medical ward (delete as appropriate)	2 points or more
DVT unlikely	1 point or less

Mr Sameh Dimitri VTE lead. Carys Humphreys ANP Vascular[a]

Adapted with permission from Wells PS et al. (2003) Evaluation of D-dimer in the diagnosis of suspected deep-vein thrombosis

Uploaded by: Liz Kowlessar, October 2014
Review by: October 2016



If the patient has been admitted to Hospital within the last 90 days or developed a VTE event whilst being and inpatient then contact Carys Humphreys on bleep 2357/phone 2233 to leave a message with the patient details (Advanced Nurse Practitioner for Vascular).

Mr Sameh Dimitri VTE lead. Carys Humphreys ANP Vascular Philip Newman Lead Pharmacist for Urgent care Medical Specialities, Jayne Frith
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Treatment guidelines for confirmed DVT revised following NICE technology appraisal guidance 261

Introduction

Following the issue of NICE Guidance TA261 Rivaroxaban is now recommended as an option for treating deep vein thrombosis and preventing recurrent deep vein thrombosis and pulmonary embolism after a diagnosis of acute deep vein thrombosis in adults.[1]

Procedure following diagnosis of suspected DVT (see flow chart above)

1. Inform the patient of the various options.

   A. Warfarin: with tinzaparin initially. Existing preferred treatment. It is well established but requires regular blood tests. The patient will need to be treated with tinzaparin until the warfarin is able to take over.

   B. Rivaroxaban: a newer agent recently approved for use to treat DVT's and prevent recurrence of DVT and development of PE by NICE. It is as effective as warfarin and doesn't need regular blood tests. Although the chance of a major bleed is less likely than with warfarin there is no specific antidote unlike there is for warfarin.

   C. Tinzaparin: Used only if the other two options are unsuitable/contraindicated

2. Obtain bloods to check U&E's and full clotting screen.

3. Depending on the treatment chosen follow the guideline below.

A. Guideline for patients suitable for tinzaparin followed by warfarin

1. Make a referral to the anticoagulant clinic using the AC1 form.
2. Teach the patient how to self-administer tinzaparin. If the patient is unable to do this arrange for the district nurses or practise nurse to administer depending on patients ability to travel.

3. Counsel the patient on warfarin as per the yellow book and warfarin therapy patient information booklet (in house booklet code WZZ5290nOct10pi)

4. Give the patient enough warfarin and tinzaparin to last until their appointment in the anticoagulant clinic. Dosage is according to the relevant local guidelines. Once stabilised the anticoagulant clinic will refer to the GP for further prescribing but may continue to dose the patient using the DAWN system.

5. Make an appointment in the vascular clinic in six weeks. At this appointment the patient will be assessed for the duration of treatment required (3, 6, 12 months or as judged appropriate by the vascular surgeon). **It is important that the duration of treatment is then communicated with the GP who will continue prescribing until the course is finished. The anticoagulant clinic also need to be informed.**

6. Fit patient with a stocking and if appropriate refer to the stocking clinic

NB Guidelines for the initiation, dosing and monitoring of warfarin are available on the hospital intranet or on the anticoagulant prescription charts and referral forms.

B. Guideline for patients suitable for rivaroxaban

1. Complete the prescribing checklist (Appendix 1)

2. Counsel the patient using the table below (Appendix 2)

3. Give the patient a three week supply and send a referral letter to the GP (at the end of Appendix 1) directing them to continue prescribing. Also send a copy of the GP referral to the anticoagulant clinic for their information.

4. Make an appointment in the vascular clinic in six weeks. At this appointment the patient will be assessed for the duration of treatment required (3, 6, 12 months or as judged appropriate by the vascular surgeon). **It is important that the duration of treatment is then communicated with the GP who will continue prescribing until the course is finished. Please copy in the anticoagulant for information.**

5. Fit patient with a stocking and if appropriate refer to the stocking clinic

C. Guideline for patients suitable for tinzaparin alone

1. Teach the patient how to self-administer tinzaparin. If the patient is unable to do this arrange for the district nurses or practise nurse to administer depending on patients ability to travel.

2. Supply enough tinzaparin to allow them to obtain continuing supplies from their GP. Refer to the GP for continuing prescribing.

3. Make an appointment in the vascular clinic in six weeks. At this appointment the patient will be assessed for the duration of treatment required (3, 6, 12 months or as judged appropriate by the vascular surgeon). **It is important that the duration of treatment is then communicated with the GP who will continue prescribing until the course is finished.**

4. Fit patient with a stocking and if appropriate refer to the stocking clinic

NB refer to 'Oral and parenteral anti-coagulation for inpatients' for dosing information (Appendix 3)

References

1: Summary of product characteristics for Xarelto available online at **www.medicines.org.uk** . Accessed April 2013

2: NICE Technology appraisal guidance 261 issued July 2012

3: Joint Medicines Formulary AF Guidelines: Appendices III, V and VII

Appendix 1 Prescribing Check list for Rivaroxaban and referral form for GP (adapted from AF guidelines)

Patient Factors	Dose of Rivaroxaban
• Hypersensitivity to the active substance or to any of the excipients. • Clinically significant active bleeding. • Severe renal impairment eGFR or CrCl < 15mls/min • Hepatic disease associated with coagulopathy and clinically relevant bleeding risk including cirrhotic patients with Child Pugh B and C. • Pregnancy and breast feeding • Concomitant treatment with systemic treatment with azole-antimicotics (such as ketoconazole, itraconazole, voriconazole and posaconazole) or HIV protease inhibitors (e.g. ritonavir). These active substances are strong inhibitors of both CYP3A4 and P-gp and therefore may increase rivaroxaban plasma concentrations to a clinically relevant degree (2.6 fold on average) which may lead to an increased bleeding risk (see interactions).	**Avoid as contra –indicated**
If your patient has any of the following increased bleeding risk factors: • Concomitant treatment with interacting drugs (see interactions table) • Rivaroxaban is to be used with caution in patients with eGFR or CrCl 15 - 49 ml/min. • History of ▪ congenital or acquired bleeding disorders ▪ uncontrolled severe arterial hypertension ▪ active ulcerative gastrointestinal disease ▪ recent gastrointestinal ulcerations ▪ vascular retinopathy ▪ recent intracranial or intracerebral haemorrhage ▪ intraspinal or intracerebral vascular abnormalities ▪ recent brain, spinal or ophthalmological surgery ▪ bronchiectasis or history of pulmonary bleeding. And all MAJOR risk factors have been excluded. • If more than two of the above risk factors reconsider overall risk versus benefit of treatment with rivaroxaban	**Use with caution giving 15mg BD for the first three weeks and consider reducing the maintenance dose to 15mg od**
Patients with active cancer • Rivaroxaban is less effective than LMWH at preventing venous thromboembolism recurrence. NICE TA does however recognize the limitations of daily injections and that these patients may be considered for treatment with rivaroxaban.	**Only use after consultation with vascular consultant and consultant treating the active cancer**
If your patient is: • > Age 18 years • eGFR or CrCl≥50mls/min And all major and additional risk factors for bleeding have been excluded as per contraindications	**Initiate standard dose of 15mg bd for three weeks followed by 20mg daily**

Monitoring

There is no routine anticoagulant monitoring for rivaroxaban.

Rivaroxaban is known to increase the PT and APTT but these levels do not correlate with the anticoagulant activity or drug levels. It may have some correlation with anti Xa assay.

Adverse effects must be reported to the Committee on Safety of Medicines (CSM). http://yellowcard.mhra.gov.uk/

Renal Function

Whilst on treatment, renal function should be assessed in certain clinical situations when it is suspected that renal function could decline or deteriorate (such as hypovolaemia, dehydration, and with certain co-mediations e.g. high dose diuretics). The dose of rivaroxaban should be reviewed in these circumstances.

Bleeding Risk

As with all anticoagulants, rivaroxaban should be used with caution in conditions with an increased risk of bleeding. Bleeding may occur at any site during therapy with rivaroxaban. An unexplained fall in haemoglobin and/or haematocrit, blood pressure or other clinical features suggestive of bleeding should lead to further investigation. Close clinical supervision is recommended throughout the treatment period, especially if risk factors are combined.

Interactions with Rivaroxaban

Interacting Drug	Advice
Systemic treatment with azole-antimicotics - e.g. ketoconazole, itraconazole, voriconazole and posaconazole or HIV protease inhibitors e.g. ritonavir	These active substances are strong inhibitors of both CYP3A4 and P-gp and therefore may increase rivaroxaban plasma concentrations to a clinically relevant degree (2.6 fold on average) which may lead to an increased bleeding risk. **Combination is not recommended.**
Dronedarone	Inadequate clinical data. **Co-administration should be avoided.**
Rifampicin, phenytoin, carbamazepine, phenobarbital, St Johns Wort	Strong inducers of CYP3A4 lead to a significant decrease in efficacy of rivaroxaban. **Concomitant therapy is best avoided. Use with caution**
Other anticoagulants	Due to the increased bleeding risk, care is to be taken if patients are treated concomitantly with any other anticoagulants (usually during switching between agents).
NSAIDs/platelet aggregation inhibitors (e.g. ticagrelor, aspirin, clopidogrel and prasugrel), other anticoagulants, GPIIb/IIIa inhibitors	Bleeding risk is increased. For patients at risk of ulcerative gastrointestinal disease an appropriate prophylactic treatment may be considered where combination is necessary.
Midazolam	Not considered clinically relevant
Digoxin	Not considered clinically relevant
Atorvastatin	Not considered clinically relevant
Omeprazole	Not considered clinically relevant
Fluconazole	Not considered clinically relevant
Erythromycin and clarithromycin	Not considered clinically relevant

Acutely unwell patients

While on treatment with rivaroxaban renal function should be assessed in clinical situations where it is suspected that renal function could decline or deteriorate.

Consider temporarily substituting rivaroxaban with prophylactic LMWH in patients who are admitted to hospital with sepsis, acute kidney injury, hypovolaemia, dehydration or who are started on high dose diuretics.

Compliance Aids

Rivaroxaban tablets may be dispensed in a compliance aid.

Swallowing difficulties

There is no safety data or pharmacokinetic studies available on crushing rivaroxaban tablets therefore this should be avoided.

Overdose with Rivaroxaban

Overdose exposes the patient to an increased risk of bleeding. If the PT and APTT is prolonged this indicates that rivaroxaban is still pharmacologically active and the patient should be closely monitored for signs of bleeding. The APTT or PT level does not correlate with the drug level.

Surgery

If a patient is admitted to hospital and requires emergency surgery then if possible try to delay surgery until at least 24 hours after the last dose of rivaroxaban. More time may be required if the patient has renal impairment.

Management of new oral anticoagulants in patients undergoing surgery.	
PRE PROCEDURE	
Rivaroxaban	
eGFR or CrCl >50 ml/min	Miss 2 doses (two days)
eGFR or CrCl <50 ml/min	Miss 4 doses (four days)
eGFR or CrCl< 15ml/min	Discuss with haematology
POST PROCEDURE	
Do not restart medication until haemostasis has been achieved (24-72 hours) and epidural has been removed (See note 1).	

Note 1. If a patient has spinal/epidural anaesthesia they should delay restarting until at least 6 hours after removal of the catheter.

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Referral Form to be sent to GP along with a copy of the patient counselling checklist (Appendix 2), following decision to start Rivaroxaban (please also copy in the anticoagulant clinic for information)

Addressograph (if addressograph unavailable fill in details below)

Name: _____ DOB_____

Hospital Number: _____ NHS number: _____

If eGFR <60mls/min or eGFR not available calculate Creatinine Clearance (CrCL):

eGFR or CrCL <15ml/min contraindicates treatment

(140 – Age……..) X Weight *…….. X **CONSTANT** …….

Serum creatinine…… **= …… ml/min**

CONSTANT
Male = 1.23
Female = 1.04

* Female use actual body weight ≤ 60kg, if > 60kg use 60kg. Male use actual body weight ≤ 70kg, if > 70kg use 70kg

Renal Function	Recommended dose
Normal or mild dysfunction 50ml/min and above	15mg bd for 3 weeks following diagnosis then 20mg od
Moderate (30-49ml/min) or severe (15-29ml/min)	15mg bd then consider reducing the maintenance dose from 20mg od to 15mg if bleeding risk exceeds the risk for recurrent DVT and PE (see above)
Less than 15ml/min	Rivaroxaban not recommended

NB The 15mg maintenance dose hasn't been studied in this clinical setting but is based on pharmacokinetic studies (see SPC for details)

Indication for rivaroxaban (as per NICE TA 261) –

Treatment of DVT and prevention or recurrent DVT and PE following an acute DVT in Adults ☐

Warfarin is unsuitable (state reason) ……..

Contraindications excluded – see prescribing checklist (Appendix 1) ☐

Patient has been counselled ☐

Patient understands the potential bleeding risks with rivaroxaban and is aware that there is currently no antidote for these effects. ☐

Consultant/GP signature: ……Print name: ...……Date: ……

Counselled by (signature): ……Print name: ……...Role: ……Date: ……..

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Appendix 2 Counselling guide for Rivaroxaban (adapted from AF guidelines) (copy to be sent to GP for information along with GP referral form)

Patient Counselling for Rivaroxaban	Check
• All patients should be given the rivaroxaban alert card and counselled on the details. This should be carried with them at all times.	
• Patients should be aware of the importance of good compliance. To ensure optimal protection from blood clots, never skip a dose. • Do NOT stop taking unless advised by your doctor.	
• Rivaroxaban should be taken with food.	
• Patient understands the potential bleeding risks with rivaroxaban and is aware that there is currently no readily available antidote for its effects and the potential ramifications of this.	
• As this medicine prevents blood clotting, the most common side effects associated with treatment involve bruising or bleeding. • Not all patients will experience side effects. However, patients should be aware that they should contact their doctor straight away if they notice any sign of bruising or bleeding while taking this medicine. • This includes any signs of blood in the urine, or any sign of bleeding from the stomach or intestine, for example vomiting blood and/or passing black/tarry/blood stained stools.	
• Patients should seek urgent medical attention if they fall or injure themselves during treatment, especially if they hit their head, due to the increased risk of bleeding.	
• Lifestyle advice regarding contact sports or extreme sports should be included in the counselling where appropriate as an injury whilst taking rivaroxaban could cause serious bruising or bleeding.	
• All patients should be advised on what to do if they miss a dose of rivaroxaban: • If a dose is missed during the initial twice daily treatment phase (day 1-21) take a dose immediately it is remembered to ensure a total dose of 30mg each day. In this case two 15mg tablets can be taken at once. They should then continue to take 15mg twice daily as prescribed • If a dose is missed during the once daily phase (day 22 onwards), the patient should take rivaroxaban immediately it is remembered, and continue with the daily dose on the following day. The dose should NOT be doubled up on the same day to make up for a missed dose on the previous day	
• It is important that patients inform other health professionals treating them, including their dentist and pharmacist that they are taking this medicine. • Inform a healthcare specialist if they need to have surgery or an invasive procedure.	
• Patients should take care when buying over the counter medicines and avoid those that have the potential to interact such as NSAID (aspirin, ibuprofen) medications or herbal products such as St John's Wort. If they are worried about any medicines they should discuss with their GP or Pharmacist	
• Patients may experience dizziness and this may have a (small) effect on ability to drive.	

Appendix 3 Tinzaparin dosing table extracted from COCH policy 'Oral and parenteral anti-coagulation for inpatients'

Patient's Kg	Tinzaparin dose 175 IU/kg	Number of ml injected subcutaneously	Syringe to use
50	9,000 units	0.45ml	RED 0.5ML SYRINGE
55	10,000 units	0.50ml	
60	11,000 units	0.55ml	YELLOW 0.7ML SYRINGE
65	11,000 units	0.55ml	
70	12,000 units	0.60ml	
75	13,000 units	0.65ml	
80	14,000 units	0.70ml	
85	15,000 units	0.75ml	BLUE 0.9ML SYRINGE
90	16,000 units	0.80ml	
95	17,000 units	0.85ml	
100	18,000 units	0.90ml	
105	18,000 units	0.90ml	
110 +	Continuing dosing at 175 IU/kg	Use the GREEN vial (40,000 i.u/2ml) or make up dose with a combination of prefilled syringes. Some patients merit B.D. dosage: take advice from anticoagulant clinic	GREEN 2ML VIAL or a combination of prefilled syringes