Trust Guidelines

University Hospitals Plymouth NHS Trust

Guidance Title: Deep Vein Thrombosis Guidelines

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March 2021	**V3**

Accountabilities	
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Links to other documents

Version History		
V1	June 2011	Guideline created
V2	June 2019	Guideline updated
V3	March 2021	Guidance updated

Last Approval	Due for Review
March 2021	March 2023

DEEP VENOUS THROMBOSIS (DVT)

RECOGNITION AND ASSESSMENT

Symptoms	Signs
Swelling of calf or thigh (or both)	Pitting oedema
Pain and stiffness of affected limb (Lower or upper limb)	Increased skin temperature
Redness of affected limb	Erythema
	Tenderness
	Mild fever

Differential diagnosis

- Ruptured Baker's cyst. There may be a history of arthritis and of a swelling behind the knee or of trauma to the knee. Examine for arthropathy and effusion.
- Torn calf muscles/damage to Achilles tendon. Usually follows sudden twisting of leg, resulting in immediate pain in the calf. Examine for haematoma and, if rupture severe, for disruption of the tendon.
- Cellulitis. Margin of erythema may be more clearly demarcated. Look for portal of infection

IMMEDIATE MANAGEMENT

There is a fully functional, nurse-led DVT assessment and management clinic based on ED Minors level 6 who take referrals direct from GP's and will book a scan time after taking some patient details including Wells score to ensure exclusion criteria are not met (see Appendix 3 for exclusion criteria). If patients present at weekends or between 5pm and 9 am, then the management proforma below, should be followed and the patient referred for investigation and scanning using a Salus referral. DVT clinic are contacted on ext. (4)31978 or if excluded then the acute GP service on (4)37777.

For suspected DVT on an inpatient the ultrasound is requested through iCM and there is no indication to carry out a D-dimer test in this instance as certain diseases/conditions apart from DVT often raise D-dimer. See Appendix 2 for details

If symptoms are severe, or there are associated respiratory symptoms, or if patient requires admission to hospital for reasons other than suspected DVT or if outpatient management would be impractical then arrange admission to hospital.

The flow chart below is for suspected DVT for patients presenting to hospital and not for inpatients who have their Doppler ultrasound booked using iCM.

These guidelines are for the treatment of upper and lower limb thrombosis and not thrombosis in unusual sites there is guidance for this available at https://b-s-h.org.uk/guidelines/guidelines/investigation-and-management-of-venous-thrombosis-at-unusual-sites/

SUSPECTED DEEP VEIN THROMBOSIS: FLOW CHART NEW PATIENTS

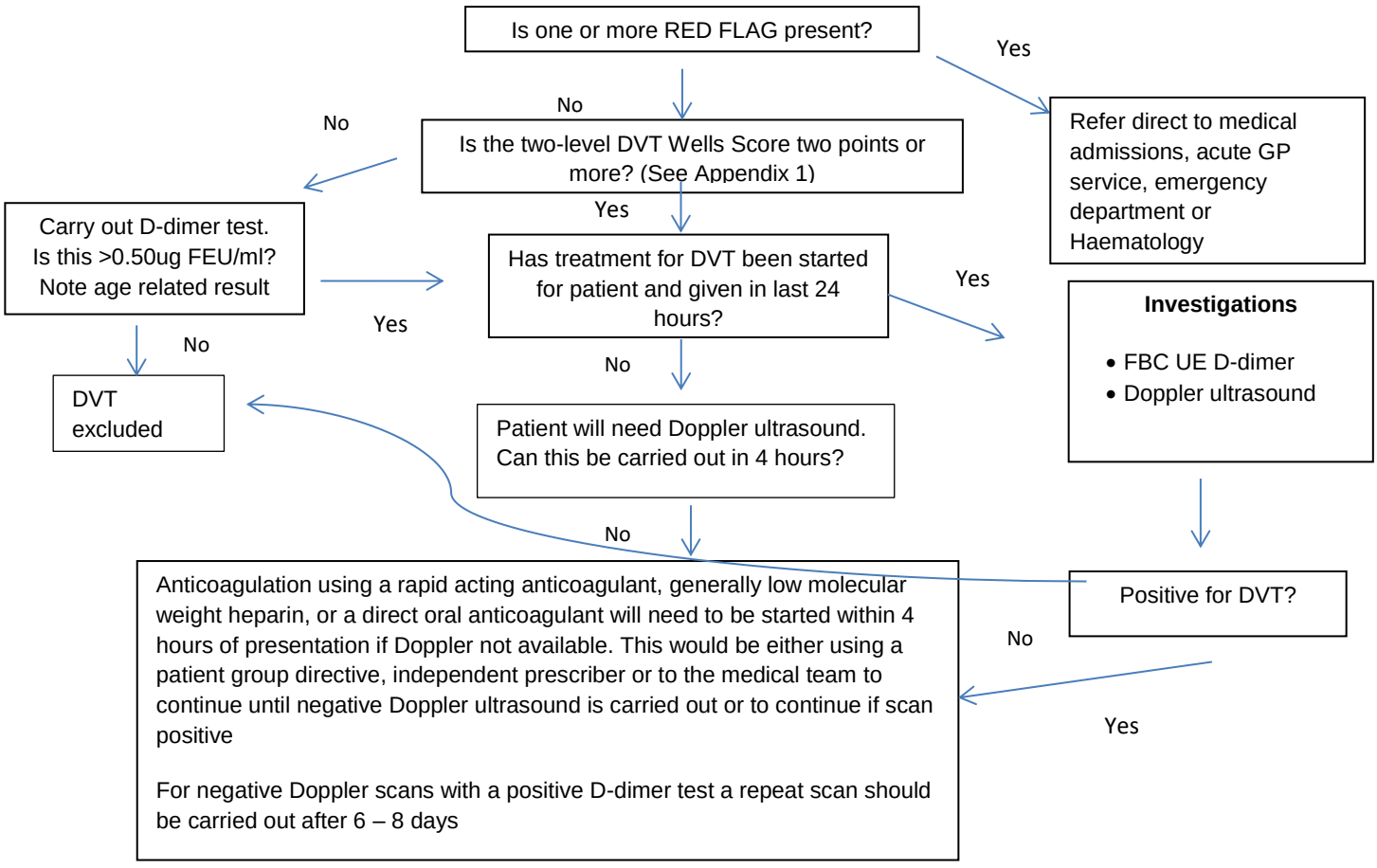
DVT is a condition where a blood clot (thrombus) forms, usually in the lower limbs. Signs and symptoms include pain, swelling and/or tenderness as well as a heavy ache and warm skin in the area of the clot, though only about half of patients who have a DVT display symptoms.,. Treatment with anticoagulation is needed to prevent the clot embolising and travelling to the lungs to block blood flow, causing PE.

Initial assessment	
• Obtain patient's medical history including any previous thrombotic events and anticoagulation treatment	• Ask the patient to undress as appropriate to measure and compare both lower limbs
• Perform observations including respiratory rate and oxygen saturations via pulse oximetry	

Ongoing assessment	
• Check if patient already is on anticoagulation and any allergies or drug interactions	• Carry out two-level DVT Wells Score
• Consider known risk factors for DVT e.g. immobility, dehydration, recent hospital admission, or personal or family history of VTE	• Identify if any red flags present
• Measure legs, mid-thigh and mid-calf, to identify any differences in size and record findings	

Red flags

- New chest pain or shortness of breath
- Unable to talk in full sentences
- Systolic BP <90 mmHg
- Active bleeding
- New haemoptysis
- HR >100 bpm
- Allergy or contraindication to anticoagulation
- Platelet count < 100 $10^{*9/L}$ refer to haematology



Care planning

- Commence anticoagulation treatment, if not already started, using DOAC, LMWH or warfarin, taking into account patient choice and explain how to take medication, including the risks and side-effects if any see table below
- If Platelet count < 100 $10^{*9/L}$ refer to haematology for treatment
- Safety netting if new symptoms or any red flags experienced to present at GP or ED as needed
- Arrange follow up drug dosage for DOAC changes after 1-3 weeks depending on type or INR, check if needed
- Ensure patient carries yellow anticoagulation card at all times
- NICE guidance is to review at 3 months and consider cancer investigations on unprovoked VTE with current guidance being Do not offer further investigations for cancer to people with unprovoked DVT or PE unless they have relevant clinical symptoms or signs

Treatment

- Advise elevation of leg whenever immobile.
- Simple analgesia – avoid NSAIDs (may increase INR and increase risk of bleeding).
- Once diagnosis confirmed, check blood has been taken for FBC, INR, and APTT
- Discuss the treatment options for DVT as detailed below
- Routine monitoring of anticoagulation is not required. Anti-Xa monitoring *may* be helpful in patients with extremes of body weight or severe renal impairment. Please discuss with haematology and refer to Anti-Xa and DOAC monitoring guidelines with guidance currently pending

Drug/ Brand Name	**Rivaroxaban (Xarelto)**	**Dabigatran (Pradaxa)**	**Apixaban (Eliquis)**	**Edoxaban (Lixiana)**	**Warfarin Coumadin**	**Clexane Enoxaparin**
Dosage Adults > 61kg	15mg BD 3/52 followed by 20mg OD	150mg BD following at least 5/7 treatment with LMWH	10mg BD 7 days then 5mg BD	60mg OD following at least 5/7 treatment with LMWH reduce dose to 30mg OD if weight <61kg	Variable dependent upon INR once daily following treatment with LMWH	Weight related dose
Further dose change	After 6/12 Rx equipoise patients can reduce to 10mg OD	No routine change	After 6/12 Rx reduce to 2.5mg BD	No routine change	No routine change	No routine change
Renal Function	If creatinine clearance 15-49ml/minute reduce to 15mg OD maintenance dose	If creatinine clearance 30-50ml/minute reduce to 110mg BD	Use with caution if creatinine clearance 15-29ml/minute	Reduce dose to 30mg OD in moderate to severe impairment	In severe renal failure monitor INR more often	CC <15ml/ minute avoid use
Food	Must be taken with Food	Not needed	Not needed	Not needed	Foods with Vit K will affect INR	Not needed
Reversal Agents	Not currently	Yes	Not Currently	Not Currently	Yes	Partial

Routine Lab Monitoring	Annual FBC U&E	Annual FBC U&E	Annual FBC U&E	Annual FBC U&E	Routine INR Monitoring	Anti Xa levels may be required in obese patients, pregnant or severe renal impairment

Enoxaparin dose banding table

N.B. ALWAYS weigh the patient do not rely on estimation of body weight

Weight	Dose GFR > 30ml/min (1.5 mg/kg approx.)	Dose GFR <30ml/min (1 mg/kg approx.)
40 – 49kg	60mg Daily	40mg Daily
50 – 59kg	80mg Daily	60mg Daily
60 – 74kg	100mg Daily	60mg Daily
75 – 89kg	120mg Daily	80mg Daily
90 – 109kg	150mg Daily	100mg Daily
110 – 120kg	180mg Daily	120mg Daily
For patients over 120 kg or complex cases advice may be obtained from a Consultant Haematologist.		

- If warfarin is to be used then follow the algorithm for initiation of oral anticoagulation as given in the Adult Oral Anticoagulation Guidelines (also printed in the inpatient drug administration chart on page 10 or on the EPMA system).
- If INR > 1.3 initiation of warfarin should be deferred until advice sought from Haematologist and more cautious loading will probably be advised.
- The warfarin dose should be recorded in the yellow anticoagulant book.
- Treatment with DOAC dosing is shown above in table above and this should always be for a minimum of three months
- NICE guidance around malignancy investigation is for people with unprovoked DVT or PE who are not known to have cancer, review the medical history and baseline blood test results including full blood count, renal and hepatic function, PT and APTT, and offer a physical examination. Do not offer further investigations for cancer to people with unprovoked DVT or PE unless they have relevant clinical symptoms or signs
- Grade 2 or 3 below knee compression hosiery should be used as soon as these can be comfortably worn. Advise continuing use for at least 24 months. However two trials published have not shown a significant reduction in post thrombotic syndrome by wearing compression stockings. In addition a further trial showed wearing for one year was non-inferior to two years wear. Our current practice is to advise patients to wear on the affected leg only for 1 -2 months and see whether this gives any benefit. If this has no effect on their leg swelling, comfort or leg problems then to discontinue.

https://www.bmj.com/content/353/bmj.i2691

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(13)61902-9/abstract

Specific Clinical Scenarios

- For patients at increased risk of bleeding including those who have severe liver failure, thrombocytopenia, congestive cardiac failure and those following surgery, trauma or haemorrhagic stroke: Discuss with haematologist - consider using lower doses of

enoxaparin (1mg/kg – see dose banding) and use lower dose warfarin loading regimen (see Oral Anticoagulant Guidelines or table in the inpatient drug administration chart or EPMA).

- **Compromised arterial circulation secondary to DVT**: This is a rare complication characterised by severe pain, swelling, cyanosis and the rapid development of tense oedema (Phlegmasia cerulea dolens). In such cases elevate bed foot to 40° and ensure fluid replacement adequate to compensate for extravasation. Refer to vascular surgical team urgently.

DISCHARGE POLICY

- If the patient it being treated with warfarin they should be stabilized on this with the INR in the appropriate range before discharge to GP care. Complete letter to GP (e-Discharge letter for inpatients) explaining management plan.
- The patient should be warned that many drugs (including alcohol) interact with warfarin and to remind their GP that they are taking warfarin if other medications are added, stopped or doses changed. The importance of a regular diet of vitamin K containing foods to ensure that the INR stays within therapeutic limits.
- If a DOAC is being used ensure the appropriate loading schedule has been prescribed if applicable and a plan for the dose change at either one week or three weeks dependent upon the drug used. Any interactions are discussed and the importance of taking with food if Rivaroxaban is being given.
- Due to the relatively short life of the DOAC's the importance of not missing doses should be stressed.
- It is imperative that women of childbearing age are warned of the teratogenic effects of warfarin and DOAC's and that if they become pregnant whilst taking warfarin or a DOAC they inform a doctor immediately.
- Give patient a **yellow Oral Anticoagulation Pack** if on warfarin (containing an information booklet, a monitoring booklet and a warfarin alert card). Complete the following information: indication for warfarin, target INR, start date and duration of therapy, the last four INR results and the date of the next INR.
- For patients on a DOAC the appropriate patient alert card should be given and patients instructed to carry this with them.
- Anticoagulation on warfarin should be monitored initially very frequently (less than a weekly basis).
- Anticoagulation should be monitored by GP. Ensure that an **Anticoagulant Discharge Form** (On the e-Discharge system) is completed and sent to pharmacy to be faxed to the GP
- Arrange haematology follow up, Red top to Dr Tim Nokes or Dr Wayne Thomas Haematologists, follow-up appointment if long term anticoagulation is under consideration. The current guidance from NICE is for a review at 3-6 months for patients presenting with either unprovoked or semi-provoked thrombosis to look at whether to stop or continue anticoagulation.

Duration of Anticoagulation

Indication	**Circumstances**	Duration
Below knee DVT	Post-op	6 weeks
Below knee DVT	Other situations	3 months
Above knee DVT	Idiopathic or non-recurring event	3 - 6 months
Any DVT	Ongoing risk factors e.g. active cancer	Consider continuing until risk lost
Recurrent DVT	On therapeutic anticoagulation	High intensity INR 3.5 for 6 months and consider long term treatment and/or referral to
Recurrent DVT	Two spontaneous events	Consider life-long treatment

Appendix 1

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 the 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
Clinical probability simplified score	
DVT likely	**2 points or more**
DVT unlikely	**1 point or less**

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

Appendix 2

Examples of clinical states other than venous thromboembolism associated with an elevated D-dimer concentration

Acute myocardial infarction
Chronic subdural haematoma
Disseminated intravascular coagulation
Gram negative bacteraemia or any infection e.g. cellulitis
Malignancy
Peripheral vascular disease
Pregnancy
Recent surgery
Renal disease
Rheumatoid disease
Sickle cell crisis
Subarachnoid haemorrhage or bleeding from any source
Thrombolytic therapy
Trauma with pathological thrombosis

Appendix 3 DVT Clinic Exclusion Criteria

Is under the age of 17 years old

Is known to be allergic to enoxaparin, other LMWH, unfractionated heparins or DOAC medication

Is or may be pregnant.

Has a eGFR of <30ml/min. (creatinine >200(micromolesl/l) and/or has a known history of renal impairment

A history of haemorrhagic stroke

A history of an ischaemic stroke within the last 6 weeks

GI bleeds in the last 6 months

Uncontrolled hypertension BP > 170 / 100mmHg

Is uncooperative / unable to give informed consent or to understand the treatment/explanation of the treatment and condition.

A history of alcoholism

Trauma or surgery to the CNS or eye within the last month

Baseline Prothrombin Time > 18 seconds

Baseline APTT > 38 seconds

A platelet count < 100 or > 600 10*9/L

Hb <10 g/dL women

Hb <11 g/dL men

History of thrombocytopenia with enoxaparin or other heparins

If taking clopidogrel +/- aspirin for cardiac stent then advice will be sought from cardiology / DVT clinic consultant if the patient is not medically reviewed the patient will be excluded from the DVT clinic and outcome documented in DVT clinic pathway.

NSAID's (patients who take long term for e.g. rheumatoid arthritis advice will be obtained from rheumatology consultant / DVT clinic consultant) if the patient is not medically reviewed the patient will be excluded from the DVT clinic and outcome documented in DVT clinic pathway.

Is already taking warfarin or any other treatment dose anticoagulant.

Any patient which the nurse is unhappy to treat for whatever reason

Does not consent to treatment under this patient group direction

All patients who are excluded will be referred to the take team or AGPS.