# BCAP GUIDELINES FOR PROPHYLAXIS AND TREATMENT OF VENOUS THROMBOEMBOLISM
## Including the use of LMWH (Low Molecular Weight Heparins) & newer oral therapies

**Purpose & Scope:** This guideline aims to provide sufficient information to ensure LMWHs & other newer oral treatments are used safely & appropriately in Primary Care. It is applicable to all patients who are to receive a LMWH & have been discharged from hospital, are still under the routine care of a hospital specialist through outpatient follow up, or who are being managed purely by a primary care clinician.

**Low Molecular Weight Heparins - The BCAP LMWH of choice is now Dalteparin (Fragmin®):** LMWHs are used in the '**prevention'** of venous thromboembolism (prophylaxis) in patients at high risk, are given in a **low dose** for as long as the patient is deemed to be high risk, then stopped. LMWHs when used in the '**treatment'** of VTE are given in a **higher dose** concurrently with warfarin in the first few days and continued until the INR is in the target range. Once the INR is in the target range, the LMWH is stopped. It is vital that patients are weighed and their weights recorded as doses of LMWH are based on patient weight. Please note that children under the age of 18 years will still be treated with enoxaparin.

**Dabigatran (Pradaxa®) ▼ & Rivaroxaban (Xarelto®)▼ – Both have been approved by BCAP for VTE prophylaxis following hip or knee replacement.** Dabigatran is a direct thrombin inhibitor whereas rivaroxaban is a direct inhibitor of activated factor X, unlike warfarin they require no INR monitoring. Dabigatran is taken twice daily & rivaroxaban once daily. Rivaroxaban & dabigatran can cause haemorrhage and patients should be assessed for signs of anaemia & bleeding. Where dabigatran or rivaroxaban are being used for VTE prophylaxis for hip and knee replacement the total course is to be supplied by secondary care. Dabigatran (Pradaxa®) ▼ has been approved by NICE for the prevention of stroke in atrial fibrillation (March 2012 TA249) local guidance relating to this indication is being produced. For most up-to-date information with regard to formulary and traffic light status consult the BCAP website.
http://nww.banes-pct.nhs.uk/GPsDentistsPharmacists/BCAPPrescribingandTherapeutics/Pages/default.aspx

**HOW TO USE THIS BEST PRACTICE GUIDE**

**PRIMARY CARE PRESCRIBERS-** Look at the indication you have been asked to prescribe LMWH for. Check whether you should prescribe the remainder of the course, or whether the specialist should do so. If RED indication refer back to the specialist. If AMBER, prescribe dalteparin on an FP10 (except where supplied by ASSURA) include the indication, strength of syringe, dose, patient weight. Monitor patients for Heparin Induced Thrombocytopenia (HIT) see page 4.

**SECONDARY CARE SPECIALISTS -** Look at the indication you wish to prescribe for. Check whether you have to prescribe the whole course, or whether the GP can be asked to prescribe. Ensure the patient has been accurately weighed and the weight recorded in order to calculate the correct dose. Communicate to the GP via letter: including the indication, duration of treatment and monitoring requirements especially with regard to HIT. Provide sharps bins for disposal. Ensure the GP is aware of patients discharged on dabigatran or rivaroxaban.

**SELF ADMINISTRATION:** Patients should be taught how to self-administer dalteparin, and the majority of patients will be able to do so, or have a carer do so. It is the responsibility of the prescriber initiating treatment to ensure patients and/or their carers are adequately trained where they are to self administer. Only where patients are unable or unwilling to self administer, and where carers cannot support them, then it is the responsibility of the prescriber initiating treatment to make referral to district nursing teams. **Waste Disposal**: Where people treat themselves it is their responsibility to dispose of any waste, clinical or household, that arises in a responsible way. Patients will need to be supplied with a 1L yellow SharpsGuard® or SharpsSafe®1L bin on a normal FP10 prescription. The syringes come with a needle already attached. The sharps bin must be returned to the GP practice for disposal.

**Side Effects of dalteparin – see SPC for full list of s/e** http://www.medguides.medicines.org.uk Skin rashes/ minor bruising: Haemorrhage, Thrombocytopenia, Priapism, raised Liver Function Tests Hyperkalaemia, Osteoporosis

**Overdose/Bleeding with LMWH or dabigatran and rivaroxaban:** If patient on LMWH /dabigatran /rivaroxaban is bleeding, refer directly to A & E. In the event of an overdose advice should be sought immediately from the medical on call team / A & E or the on call Hematologists. Protamine reverses the anticoagulant effect of LMWHs incompletely (about 75-85%). There is no antidote to dabigatran or rivaroxaban.

**Out of area, or private referrals:** Patients initiated on any LMWHs from other NHS hospitals or providers should be managed in line with this guidance. This may involve referring prescribing back to the specialist where the indication is RED, or considering changing the patient from another LMWH to dalteparin where it is AMBER and where the GP is happy to prescribe. It is advised that advice is sought from a member of the PCT medicines management team to facilitate this. Patients from private providers should be managed in the same way. People who opt to be referred privately (i.e. outside the NHS) are expected to pay the full cost of any treatment they receive in relation to the referral, including that of any drugs and appliances.

**High Risk examples include surgery under general anaesthesia lasting more than 30 minutes in the previous 4 weeks; travel-related VTE in the past 5 years; spontaneous VTE in the past 5 years; any VTE in past 1 year.**

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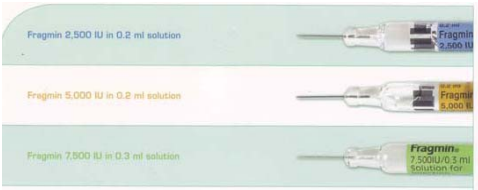
| GREEN Traffic Light – For initiation by any clinician with the competencies to do so. Nursing staff may still administer with written authorisation. |
| AMBER with Shared Care Traffic Light -– For initiation by or on the recommendation of a specialist, and continuation by a primary care prescriber in accordance with a shared care agreement and with the relevant competencies to do so. Nursing staff may still administer with written authorisation. |
| AMBER Traffic Light – For initiation by or on the recommendation of a specialist, and continuation by a primary care prescriber with the relevant competencies to do so. Nursing staff may still administer with written authorisation. |
| RED Traffic Light - Not for GP prescribing. Whole course supplied by hospital. Nursing staff may still administer with written authorisation. Prescribers should ensure adequate supplies for patients, as they will not be able to get additional supplies from their GP. GPs may be asked to monitor platelets |

## PREVENTION of DVT/PE in non pregnant MEDICAL & SURGICAL PATIENTS at HIGH RISK of DVT/PE

| Indication | Speciality | Comments | Drug and Duration | Licensed | Traffic Light |
|---|---|---|---|---|---|
| **SURGICAL patients assessed as HIGH RISK** | Vascular, day case, general surgery etc | (Excludes those on warfarin prior to surgery - see treatment section) | **Dalteparin** until no longer high risk as assessed by a clinician | Yes | Red |
| | Orthopaedics& trauma Extended Prophylaxis | Total Hip replacement | **Rivaroxaban** 10mg orally daily For 28 days post op, then stop. (Dabigatran may also be used) | Yes | Red |
| | Orthopaedics & trauma Extended Prophylaxis | Total Knee replacement | **Rivaroxaban** 10mg orally daily for 14 days post op, then stop. | Yes | Red |
| | Orthopaedics& trauma Extended Prophylaxis | Fracture neck of Femur | **Dalteparin** for 28 days post op then stop | Yes | Red |
| | Orthopaedics & trauma Extended Prophylaxis | Other High Risk patients | **Dalteparin** for the duration of immobilisation. | Yes | Red |
| | Cancer patients solid tumours Extended Prophylaxis | Major surgery abdomen /pelvis | **Dalteparin** for 28 days post op then stop | Yes | Red |
| **MEDICAL patients assessed as High Risk** | All medical specialties | | **Dalteparin** until no longer high risk | Yes | Red |
| | Haematology | Treated with VTE inducing medicine e.g lenalidomide, thalidomide | **Dalteparin** for the duration of the lenalidomide / thalidomide treatment | No | Red |
| **Flight prophylaxis for VERY HIGH RISK haematology patients ONLY** | Haematology specialist recommended only to General Practice | Sharps bin, letter showing security immigration why medically necessary to carry needles / syringes | **Dalteparin** single dose 2 to 3 hours pre flight and return 5,000 units sub cut as a single dose. British Committee for Standards in Haematology Guidelines on travel related VTE. | No | Amber |

| Patient weight | Dalteparin dose & frequency (VTE prophylaxis) |
|---|---|
| <50 kg | 2,500 units once daily by subcutaneous injection |
| 50-100kg | 5,000 units once daily by subcutaneous injection |
| 100-150 kg | 5,000 units twice daily by subcutaneous injection |
| >150 kg | 7,500 units twice daily by subcutaneous injection |




- If VTE prophylaxis with a LMWH is appropriate, dalteparin should be prescribed. In non-pregnant patients with an eGFR >10ml/min/1.73m$^2$, the dalteparin dose is determined only by weight, not renal function

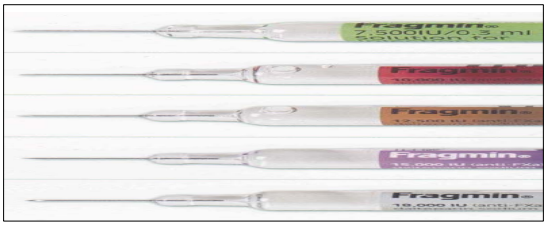
## TREATMENT of DVT / PE in ALL patients with a DIAGNOSIS (or working diagnosis) of DVT/PE

| Indication | Specialty | Drug and Duration / Comments | License | Traffic Light | LMWH Supply |
|---|---|---|---|---|---|
| **Community DVT Assura pathway (BANES pts)** | General Practice | **Follow the pathway to assess risk** (perform a DDimer if indicated). If indicated initiate **Dalteparin** ONE or TWO doses until DVT confirmed (from Assura stock). If scan confirms DVT GP to prescribe dalteparin & start warfarin. Continue LMWH for a minimum of five days until INR ≥ 2 on two consecutive days stop LMWH & continue warfarin. | Yes | Amber as rec. by Assura | NO FP10. Supply Assura stock |
| **Diagnosed DVT / PE by RUH MAU or other department** | Secondary care | DVT or PE diagnosed by Secondary care. Secondary Care to prescribe and supply dalteparin. GP to be informed of the need to start warfarin. | Yes | Red | SC full course |
| **Diagnosed DVT/ PE in Haematology / Oncology patients** | Secondary care (Oncology / Haematology) | For solid tumour oncology patients (dalteparin superior to warfarin) dalteparin full treatment dose as per table below for 1st month, then dose reduced from month 2 for 5 months (to approx 75-80% of full dose) . See full shared care guideline. | Yes | Amber with shared care | SC 1st month, GP months 2-6 |
| **Diagnosed DVT/PE in Pregnancy** | Secondary care (Maternity) | LWMH first line treatment choice. Dalteparin during pregnancy (100units/kg twice daily) NOT as below. Warfarin or dalteparin to be given for at least 6 weeks postnatally & until at least 3 months is given in total (NOT as dose table below). Warfarin / dalteparin are safe in breastfeeding | No | Red | SC full course |
| **Pregnant patients with mechanical heart valves or on warfarin prior to pregnancy.** | Secondary care (Maternity) | Patients with mechanical heart valves or on warfarin prior to pregnancy should be discussed by obs/ gynae/ cardiology/haematology ideally before pregnancy. Dalteparin prescribed (NOT as dose table below) | No | Red | SC full course |
| **HIGH RISK patients on warfarin with significantly sub therapeutic INRs** | General Practice as rec by Cardiology /Haematology | Assess risk on individual patient basis. For patients with prosthetic heart valves OR recurrent VTE i.e within the last month seek specialist advice & where indicated cover with LMWH until INR in range. THREE doses of dalteparin may be sufficient for most patients to allow INR to reach therapeutic level. | Yes | Amber | FP10 CP |
| **Diagnosed DVT / PE in warfarin intolerant / allergic** | General Practice | Refer to haematology for alternative oral options e.g phenindione /acenocoumarol. | | | |
| **Diagnosed DVT / PE in patients with NG tubes** | | Warfarin can be crushed & put down a nasogastric tube | | | |

## WARFARIN REPLACEMENT in patients on regular wafarin requiring surgery

| Indication | Speciality | Comments | Drug and Duration | Traffic Light | LMWH Supply |
|---|---|---|---|---|---|
| **Pre Surgery warfarin replacement for patients taking warfarin assessed as MODERATE/HIGH risk** | All Surgical & medical Specialities | Following preassement clinic the GP, patient (& DN) informed of the preop warfarin / dalteparin protocol i.e Last evening dose of warfarin is taken five days before surgery. Dalteparin given pre-surgery or procedure for up to five days up until the day of procedure/surgery. No dalteparin given on day of surgery. If op is cancelled / delayed contact pre-assessment clinic. | | Red | SC full course |
| **Post Surgery** | All Medical & Surgical Specialities | LMWH given with warfarin whilst waiting for INR to come into range. Depending upon INR & bleeding risk give warfarin continue LMWH until stable INR (can take 48 hours to achieve INR >1.5 & five days to achieve therapeutic INR) Stop LMWH when INR in range continue warfarin. | | Red | SC full course |
| **All Providers operating on NHS patients are to supply dalteparin (or LMWH) for pre and post warfarin replacement (as above)** | | | | | |

| Patient weight Kg | Dalteparin dose & frequency (units) VTE treatment dose |
|---|---|
| 40-46 kg | 7,500 units once daily by subcutaneous injection |
| 47-56 kg | 10,000 units once daily by subcutaneous injection |
| 57-68 kg | 12,500 units once daily by subcutaneous injection |
| 69-82 kg | 15,000 units once daily by subcutaneous injection |
| 82-120 kg | 18,000 units once daily by subcutaneous injection |




If VTE prophylaxis with a LMWH is appropriate, dalteparin should be prescribed. In non-pregnant patients with an eGFR >10ml/min/1.73m$^2$, the dalteparin dose is determined only by weight, not renal function

# PREVENTION of DVT/PE before PREGNANCY, during PREGNANCY and following DELIVERY

This guidance below summarises the Wiltshire Community Health Service guidelines which are based upon the Royal College of Obstetrics & Gynaecology Guidelines Greentop Guideline No37 Reducing the Risk of Thrombosis and Embolism during pregnancy and in the Puerperium 2009). http://www.rcog.org.uk/womens-health/clinical-guidance/reducing-risk-of-thrombosis-greentop37 Refer to Wilts guidelines Jan 2011 (PN = postnatal)

## PRECONCEPTUAL advice in patients on warfarin

Patients with mechanical heart valves or those on long term warfarin prior to pregnancy should be discussed with consultant cardiologists / haematologists, ideally before pregnancy. LMWH does not need to be initiated prophylactically in these patients before pregnancy is confirmed (see treatment of DVT/PE in all patients page)

## Prophylaxis of HIGH Risk and VERY HIGH RISK pregnant patients

| Indication | Comments | Drug Duration | Licence | Traffic Light | Supply |
|---|---|---|---|---|---|
| **Obstetric assessed as VERY HIGH RISK** | URGENT REFERAL Previous VTE on warfarin / VTE in current pregnancy/ Anti Thrombin Deficiency / Mechanical Heart Valves | Antenatal TREATMENT dose dalteparin during pregnancy. At least 6 weeks (or until a total of 3 months of treatment given) PN anticoagulant either warfarin or dalteparin & TEDs. GPs may prescribe dalteparin on advice of consultant for short time until patient attends urgent appointment. | No | Red | Maternity services full course |
| **Obstetric assessed as HIGH RISK** | Single previous VTE plus Thrombophilia or family history OR Unprovoked/oestrogen-related Previous recurrent VTE (> 1) | Requires antenatal PROPHYLACTIC dose with dalteparin and at least 6 weeks (or until a total of 3 months of treatment given) PN prophylactic anticoagulant either warfarin or dalteparin and TEDS | No | Red | Maternity services full course |
| **Obstetric assessed as INTERMEDIATE RISK** | Refer to obstetric team for consideration of whether antenatal prophylaxis is required. Dalteparin treatment where appropriate for this group of patients will be provided by maternity services. At least 7 days PN prophylactic dalteparin | | No | Red | Maternity services full course |

**For patients who are diagnosed with a DVT or PE in pregnancy a treatment dose is required (see previous page)**

Weight: Use pre-pregnancy or booking weight at approximately 16 weeks NOT the current weight

Warfarin should usually be avoided during pregnancy. It can be used after delivery and during breast feeding.

## Contraindications to LMWH

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| Recent cerebral haemorrhage or acute cerebral infarct | Prophylactic doses are not required if receiving therapeutic anticoagulation (e.g. Warfarin) |
| Active peptic ulcer disease or oesophageal varices | Endocarditis |
| Uncontrolled hypertension (BP > 210/120 mmHg) | Recent neurosurgery or eye surgery |
| Severe liver disease | Patients aged 90 years or over who have renal insufficiency. |
| Active bleeding or raised BASELINE INR >1.5 - seek advice from Haematologist | Treatment doses of heparin should not be given in conjunction with spinal or epidural anaesthesia. |
| Thrombocytopenia (Platelets < 80 x 109/L) | Previous heparin induced thrombocytopenia |

## Monitoring of LMWH **No routine platelet count monitoring is required after 14 days even if the treatment course is longer.**

| **Monitoring of blood results (Primary care)** |
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| For patients on long term LMWH (i.e total course is more than 10 days) checking the platelet count once between day 4-7 and again once between days 10-14 days after initiation (secondary care to inform GP/DN if required) |
| If the platelet count falls by 50% or more or the patient develops new thrombosis or skin allergy at injection sites between Day 4 and 14 consider a diagnosis of Heparin induced thrombocytopenia (HIT) and discuss with a haematologist urgently. |
| There is NO need to monitor anticoagulant activity of dalteparin, dabigatran or rivaroxaban (e.g INR or APTT) . |
| U and E monthly if high risk of hyperkalaemia (long term LMWH use) and other medicines which can cause hyperkalaemia |
| **Monitoring of blood results (secondary care)** |
| For inpatients a platelet count should be performed every 2-4 days from day 4 to day 14. |
| All patients who are to receive LMWH should have a platelet count checked on the day of starting LMWH |
| Patients exposed to LMWH in the last 100 days should have another platelet count 24 hours after starting LMWH. |
| For inpatients a platelet count should be performed every 2-4 days from day 4 to day 14. |
| Checking platelet count 4-7 and 10-14 days after initiation for patients in outpatients or request primary care to check platelets |

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|---|---|---|
| 9-5pm Monday - Friday | RUH Registrar | 01225 428331 Bleep 7559 OR 7702 OR 7413 |
| 3-5pm Monday - Friday | RUH Consultant Haematologist | 07789928466 |
| Out of Hours | RUH Consultant Haematologist | 01225 428331 Bleep on call Haematologist |