Sheffield Teaching Hospitals NHS
NHS Foundation Trust

NHS
Sheffield
Clinical Commissioning Group

The Sheffield Area Prescribing Group

Shared Care Guideline between Sheffield Teaching Hospitals NHS Foundation Trust and NHS Sheffield Clinical Commissioning Group for the prescription and supply of

Dalteparin (Fragmin®)

for patients aged 16 years and older

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1. Quick Reference to the Sheffield Shared Care Guideline for Dalteparin

	Treatment of VTE	Prophylaxis of VTE
Patients included (aged 16 years and older)	Selected patients with VTE (some cancer patients, those unstable on, unsuitable for, or with a contra-indication to oral anticoagulants, those with recurrent VTE whilst on oral anticoagulant, injectable drug users). Pregnant women with VTE	High-risk surgical patients, those with a history of thrombosis associated with central venous access, certain cancer patients, pregnant women at high-risk of VTE & for management of the antiphospholipid syndrome (recurrent miscarriage/ adverse pregnancy outcome)
Dosage & duration of therapy (see below for doses in renal impairment)	**Pregnant women:** dose based on early booking weight: Under 50kg: 5,000 units twice daily 50-64kg: 7,500 units am & 5,000 units pm 65-79kg: 7,500 units twice daily 80-94kg: 10,000 units am & 7,500 units pm 95-109kg: 10,000 units twice daily 110-124kg: 12,500 units am & 10,000 units pm 125-139kg: 12,500 units twice daily 140-154kg: 15,000 units am & 12,500 units pm 155-169kg: 15,000 units twice daily May be prescribed as once daily in patients weighing less than 90kg following review by a Thrombosis Nurse Specialist or Haematologist: Under 50kg: 10,000 units once daily 50-64kg: 12,500 units once daily 65-79kg: 15,000 units once daily 80-90kg: 18,000 units once daily Continued throughout pregnancy & for at least 6 weeks post-partum as advised by Haem/Obs clinic **All other patients:** dose based on weight (see below for dosing if creatinine clearance (NOT eGRF) less than 30mls/min): Under 45kg: 7,500 units once daily 45-56kg: 10,000 units once daily 57-68kg: 12,500 units once daily 69-82kg: 15,000 units once daily 83-100kg: 18,000 units once daily 101-115kg: 10,000 units **twice** daily 116-140kg: 12,500 units **twice** daily Over 140kg: 15,000 units **twice** daily After **4 weeks treatment**, dose is reduced to: Under 57kg: 7,500 units once daily 57-68kg: 10,000 units once daily 69-82kg: 12,500 units once daily 83-100kg: 15,000 units once daily 101-120kg: 18,000 units once daily Over 120kg: discuss with Haematologist Continue for 3-6 months if 1st event; long-term if recurrent idiopathic event; consider using long-term if ongoing risk factor	**In pregnancy for those at risk:** dose based on early booking weight and should not change: under 50kg: 2,500 units once daily 50-90kg: 5,000 units once daily 91-130kg: 7,500 units once daily 131-170kg: 10,000 units once daily Over 170kg: 75 units/kg day in 2 divided doses (rounded to the nearest whole syringe) Continued throughout pregnancy and for 6 weeks postpartum. May be stopped at term in antiphospholipid syndrome associated with recurrent miscarriages. **All other patients:** Dose based on weight: Under 45kg: 2,500 units once daily 45-99kg: 5,000 units once daily 100-149kg: 7,500 units once daily 150kg or more: 5,000 units **twice** daily High-risk surgical patients usually receive a 28 day course post-operatively or post-discharge. Patients who have surgery to repair a fractured neck of femur receive a 28 day course post-operatively. Other at-risk patients (e.g. bariatric or vascular surgery) may receive 7-10 days post-discharge. Therapy continued for duration of increased risk for other patients e.g. as long as central line is in-situ
Renal Impairment	If **CrCl 20-29ml/min** dose based on weight: Under 56kg: 7,500 units once daily 57-68kg: 10,000 units once daily 69-82kg: 12,500 units once daily 83-100kg: 15,000 units once daily 101-115kg: 18,000 units once daily 116-140kg: 10,000 units **twice** daily Over 140kg: 12,500 units **twice** daily Discuss dose reduction after 4 weeks with a Haematologist	In pregnancy: if **eGFR less than 20ml/min/1.73m^2** dose at 5,000 units once daily with anti-Xa monitoring (discuss with a Haematologist) Otherwise if **eGFR less than 20 mls/min/1.73m^2** dose at 2,500 units once daily
Hospital supply	First 28 days of treatment (high-risk surgical patients receive the total course from hospital)	
Secondary care monitoring	Baseline FBC, coag screen (for treatment doses only), U&E, LFT, accurate body weight. Repeat FBC within 24hrs and weekly for 2 weeks ONLY if the patient has had exposure to heparin/ LMWH or cardiopulmonary bypass surgery within the last 100 days. Regular potassium levels in patients risk of hyperkalaemia (*i.e. those with diabetes mellitus, chronic renal failure, acidosis, raised potassium levels, on potassium-sparing drugs or potassium supplements or on long-term dalteparin treatment.	
Primary care monitoring	Regular potassium monitoring in high risk patients*; patients weight – adjust dalteparin dose as above if weight alters. Monitor renal function – dose may need adjusting if renal function deteriorates. In high-risk surgical patients: repeat FBC weekly for 2 weeks ONLY if the patient has had exposure to heparin/ LMWH or cardiopulmonary bypass surgery within the last 100 days (details to be faxed at discharge). **No heparin induced thrombocytopenia monitoring is required for other patients on treatment or prophylaxis.**	

Patients/ carers will be taught to administer; otherwise referral will be made for administration by the Community Nursing team.

GPs will not be asked to initiate therapy; requests for shared care will be made via the Dalteparin Shared Care Form

Contents ***(click blue text for book-marked sections and linked documents)***

2. Background and supporting information

The use of low molecular weight heparins (LMWH) to prevent and treat venous thromboembolism (VTE) has increased significantly in recent years. The availability of LMWHs has permitted the treatment of VTE on an outpatient basis, and the recent NICE guidelines concerning the prevention of VTE have led to an increase in the use of prophylactic LMWH. LMWHs are now widely used for a number of licensed and unlicensed indications.

Purpose of the shared care guideline

This shared care arrangement has been developed to facilitate the prescribing and supply of LMWHs in the community and to provide a reference source for those involved in prescribing, supplying and monitoring patients who need LMWH, for treatment or prevention of VTE.

Exclusions from the shared care guideline

Patients with the following conditions are excluded from this guideline:

- History of Heparin Induced Thrombocytopenia (HIT)
- Significant hepatic impairment
- Active gastric or duodenal ulceration or oesophageal varices
- Haemophilia and other inherited bleeding disorders / major bleeding disorders
- Thrombocytopenia with platelets less than $75x10^9/L$
- Recent cerebral haemorrhage
- Severe hypertension (i.e. 230/120mmHg or higher)
- Recent neurosurgery or eye surgery
- Acute bacterial endocarditis
- Hypersensitivity to heparin, dalteparin, other low molecular weight heparins
- Peri-procedural bridging anticoagulation
- Children under 16 years

Administration of dalteparin

In most circumstances the patient or carer is advised on how to perform the administration of dalteparin. If this is not possible a referral is made to the district nurse to administer the injection.

Clinic Review

The medical team initiating treatment or prophylaxis is responsible, where required, for ensuring that the patient attends for regular disease review at intervals determined by their clinical status. This would normally be carried out by that medical team. If haematology input is desired, the GP or medical team must make a referral to Dr Maclean, Dr van Veen or Dr Saccullo (fax to 275 6126)

Contacts

If any problems or concerns arise please contact the relevant specialist:

Consultant initiating dalteparin treatment (contact details on referral form / clinic letters)	
Anticoagulant Clinic RHH:	(0114) 2713820
Dr Maclean,Dr van Veen or Dr Saccullo (consultant haematologists)	(0114) 2712500
On-call haematology SpR via RHH switchboard (including out of hours):	(0114) 2711900

3. Dalteparin for treatment of VTE disease

The categories of patient suitable for primary care continuation of prescription of dalteparin for treatment of VTE disease are follows**:**

- Cancer patients undergoing cancer therapies or with metastatic malignancy
- Injectable drug users
- Patients in whom it has not been possible to stabilise on oral anticoagulant therapy
- Patients with a contra-indication to oral anticoagulants
- Patients with recurrent VTE whilst on oral anticoagulant
- Pregnant patients with VTE disease

Such patients who are referred to primary care providers under the shared care arrangements will have been prescribed dalteparin for more than 28 days by a secondary care specialist. Where it is necessary, monitoring for heparin induced thrombocytopenia (HIT) will usually have been completed before referral to primary care.

Initial prescription & monitoring

A decision is made for a patient to be commenced on dalteparin by the patient's STHFT clinical team following discussion with the patient. Baseline investigations will be undertaken and, if satisfactory, the patient will be commenced on treatment. At discharge, the patient will be given a prescription for a 28 day supply of the drug. HIT monitoring is only required in patients who have had exposure to heparin/ LMWH or cardiopulmonary bypass surgery within the previous 100 days. If HIT monitoring is necessary arrangements will be made for it to be undertaken by the STH VTE nurse specialists as appropriate. The patient's GP will be informed of the proposed management plan and monitoring arrangements.

Referral method from secondary to primary care for continuation of supply

A formal referral to the patient's GP will be made from the STHFT medical team initiating dalteparin treatment using the Dalteparin Shared Care Form. If HIT monitoring is necessary and has not been completed, the patient will be referred to the anticoagulant clinic for monitoring (the clinic is responsible for reviewing and acting on abnormal results). A request to a general practitioner to undertake HIT monitoring may be made in selected cases if it is thought that the patient is not fit to attend STHT for such monitoring.
At the point of transfer, a medical and medication history will be provided to the GP, including:

- Consultant and contact details
- Indication for dalteparin, dose prescribed & proposed duration of treatment, including intended dose changes if applicable
- Patients weight, baseline creatinine, platelet and potassium results
- Date treatment started
- Other relevant clinical information, including concurrent medication
- Interval before patient next due to be seen by STHFT for disease review
- Any specific instructions for the practice, e.g. for continued monitoring of potassium

Treatment should only be discontinued prematurely by the GP after discussion with the responsible hospital clinician, unless there are exceptional circumstances. Treatment discontinuation must be confirmed by letter from the GP to the hospital clinician and patient and/or carer.

Primary care monitoring

Once the patient has been accepted by their primary care provider the responsibility for re-prescribing the drug and further monitoring of renal function and for hyperkalaemia, if appropriate, will pass to the patient's practice (see "Responsibilities of the Practice"). This will be communicated via the dalteparin shared care form. It is advised that this monitoring is done regularly, according to clinical judgment, and action taken as appropriate. **Since the dose of dalteparin for treatment of VTE is calculated based on weight, non-pregnant patients on long-term treatment or prophylaxis should be accurately re-weighed** (at a frequency determined by clinical judgement e.g. more often if rapid weight loss) **and the dosage of dalteparin adjusted accordingly** see appendix 1).

4. Dalteparin for prophylaxis of VTE disease

The patients who may be discharged from secondary care on thromboprophylaxis with dalteparin are:

- High risk surgical patients requiring extended prophylaxis according to NICE and STHFT guidelines
- Those with a history of thrombosis associated with central venous access lines
- Pregnant women requiring prophylaxis
- Cancer patients undergoing cancer therapies or with metastatic malignancies

4.1 High risk surgical patients discharged on extended thromboprophylaxis:

Prescription & monitoring

All high risk surgical patients who need extended thromboprophylaxis following discharge will be given sufficient dalteparin on the discharge prescription to complete the full course of prophylaxis. **It will only be necessary for GPs to undertake monitoring for heparin induced thrombocytopenia (HIT) in patients who have had exposure to heparin/LMWH or cardiopulmonary bypass surgery within the previous 100 days.** A letter will accompany these patients which will include information about:

- Baseline platelet count
- Date of surgery
- Date of discharge
- Date(s) that repeat platelet counts are required (24 hours after starting dalteparin then weekly for 2 weeks; some of which may have been completed during the in-patient admission).
- Action to be taken if the platelet count drops or the patient develops thrombotic symptoms

4.2 Other patients on prophylactic dalteparin:

Initial prescription & monitoring

Other patients than those above will be given a 28 day supply of prophylactic dalteparin by the STHFT clinical team responsible for their care. Where it is necessary arrangements will be made for monitoring for heparin induced thrombocytopenia to be performed by the STH Anticoagulation Clinic. The patient's GP will be informed of the proposed management plan and monitoring arrangements.

Referral method from secondary to primary care for continuation of supply

A formal referral to the patient's GP will be made from the STHFT medical team initiating dalteparin treatment using the Dalteparin Shared Care Form. A full history of the patient will be provided, including:

- Name of responsible consultant and contact details
- Indication for dalteparin, dose prescribed & proposed duration of treatment, including intended dose changes if applicable
- Date treatment started
- Other relevant clinical information, including concurrent medication
- Baseline creatinine, platelet and potassium results
- Interval before patient next due to be seen by STHFT for disease review
- Any specific instructions for the practice, e.g. for continued monitoring of potassium

Treatment should only be discontinued by the GP after discussion with the responsible hospital clinician, unless there are exceptional circumstances. Treatment discontinuation must be confirmed by letter from the GP to the hospital clinician and patient and/or carer.

Primary Care monitoring

Once the patient has been accepted by their primary care provider the responsibility for re-prescribing the drug and further monitoring of renal function & for hyperkalaemia (if appropriate, see "Responsibilities of the Practice"), will pass to the patient's practice. This will be communicated via the dalteparin transfer form. It is advised that this monitoring is done regularly, according to clinical judgment.

5. Summary of Responsibilities

Responsibilities of the Hospital

- Initiate treatment with dalteparin and provide the first 28 days of treatment, or the whole course for high-risk surgical patients needing extended thromboprophylaxis post-operatively
- Instruct patient or carer on administration (or arrange for district nurse to administer where this is not possible)
- Ensure patient has been given adequate written and verbal information about what dalteparin is, why it is being used, awareness of side effects, what to do if the side-effects occur and what the arrangements are for further prescriptions
- Monitor for heparin-induced thrombocytopenia and/or hyperkalaemia during the first 14 days of treatment-dose dalteparin where necessary – see above for details.
- Make formal referral to primary care provider using the dalteparin shared care form
- Keep the patient under clinical review by the Consultant initiating dalteparin, assessing need for ongoing dalteparin treatment for up to 6 months or arranging referral to consultant haematologist to assess need for longer-term treatment
- Provide advice and support if problems occur during treatment
- Give written direction to the GP as to when treatment should be discontinued
- Conduct annual audit / review as deemed appropriate

Responsibilities of the Practice

- Accept referral from secondary care to take on continued prescribing of dalteparin under this shared care agreement after initial 28 days (or sooner if agreed). Be aware that there are a number of different preparations of dalteparin injection; **only the pre-filled syringes** should be prescribed under the terms of this shared care guideline.
- Reinforce educational points provided by the hospital.
- Monitor for HIT where requested to do so in certain high-risk surgical patients only – see above for details.
- Monitor for hyperkalaemia in those patients at higher risk of raised plasma-potassium concentrations (those with diabetes mellitus, chronic renal failure, acidosis, raised potassium concentrations, those taking potassium-sparing drugs / potassium supplements or patients on long-term treatment). Monitoring should be done regularly in these patients according to clinical judgment.
- **Re-weigh non-pregnant patients on long-term dalteparin at a frequency according to clinical judgement** e.g. more often if rapid weight loss (e.g. cancer patients) **and change weight-adjusted doses as appropriate** (see appendix 1).
- Monitor renal function and seek advice if deterioration becomes evident.
- Keep records or a register (using appropriate read codes) of all patients for whom dalteparin has been prescribed. Records should include relevant details such as indication, concurrent conditions, dose, start date, expected duration, monitoring details, adverse incidents, consultants involved in treatment, any advice or actions.
- Discontinue treatment if the patient experiences severe side effects and the relevant contact at the hospital is not available.
- Confirmation letter to patient and/or carer if treatment is discontinued.
- Conduct audit / annual review as deemed appropriate.

6. References

1. Reducing the Risk of Venous Thromboembolism during Pregnancy and the Puerperium. Royal College of Obstetricians and Gynaecologists Green Top Guideline No. 37a, April 2015. https://www.rcog.org.uk/globalassets/documents/guidelines/gtg-37a.pdf

2. Thromboembolic Disease in Pregnancy and the Puerperium: Acute Management. Royal College of Obstetricians and Gynaecologists Green Top Guideline No 37b April 2015 https://www.rcog.org.uk/globalassets/documents/guidelines/gtg-37b.pdf

3. American Society of Clinical Oncology Guideline: Recommendations for Venous Thromboembolism Prophylaxis and Treatment in Patients with Cancer. Gary H. Lyman et al. J Clin Oncol 25 http://jco.ascopubs.org/content/25/34/5490.full

4. Low molecular weight heparin for intravenous drug users with deep vein thrombosis. Michael Russell and Deborah Dawson. http://emj.bmj.com/content/21/6/711.1.full

5. Summary of Product Characteristics Fragmin®: https://www.medicines.org.uk/emc/search?q=Fragmin

6. All Wales Medicines Strategy Group. Prescribing of Low Molecular Weight Heparin in Wales http://www.awmsg.org/awmsgonline/grabber?resId=File%2F2314

7. STH Thromboprophylaxis Guidelines http://nww.sth.nhs.uk/STHcontDocs/STH_CGP/Haematology/PreventionOfVenousThromboembolicDiseaseGuidelines.doc

8. NICE Guideline 89: Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism https://www.nice.org.uk/guidance/ng89

9. DH 2010. EFA2010/001 Medical patient weighing scales https://www.cas.mhra.gov.uk/ViewandAcknowledgment/ViewAlert.aspx?AlertID=101365

10. Guidelines on the diagnosis and management of heparin-induced thrombocytopenia: second edition. Henry Watson, Simon Davidson & David Keeling. British Journal of Haematology 2012, 159: 528-540 https://onlinelibrary.wiley.com/doi/pdf/10.1111/bjh.12059

11. STH Guideline for the Investigation and Treatment of Venous Thromboembolic Disease [Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE)] http://nww.sth.nhs.uk/STHcontDocs/STH_CGP/Haematology/ThromboembolicGuideline.doc

Appendix 1: **Guidelines for Dalteparin use**

The Summary of Product Characteristics documents for Fragmin® can be found at:
https://www.medicines.org.uk/emc/search?q=Fragmin

Licensed indications included in this shared care guideline

- Prophylaxis of venous thrombosis in surgical and orthopaedic patients
- Prophylaxis of venous thrombosis in medical patients who are bedridden due to acute illness
- Treatment of venous thromboembolism (deep vein thrombosis and pulmonary embolism) until oral anticoagulant treatment has been initiated and is therapeutic
- Treatment of deep vein thrombosis or pulmonary embolism in patients with cancer

Unlicensed indications included in this shared care guideline

- In pregnancy for the prevention and treatment of venous thrombosis in pregnancy, and for treatment of the antiphospholipid syndrome
- Treatment of deep vein thrombosis or pulmonary embolism in those in whom it has not been possible to stabilise oral anticoagulants or in whom oral anticoagulants are thought to be unsuitable.
- Prophylaxis if thrombosis associated with central lines

Treatment of VTE

Treatment of VTE in the following patient groups (aged 16 years and older):

- Those with cancer or receiving cancer therapies
- Injectable drug users
- Those who it has not been possible to stabilise on oral anticoagulants
- Those with a contra-indication to oral anticoagulants
- Those with recurrent VTE whilst on oral anticoagulant

Dose in normal renal function (defined locally as calculated creatinine clearance of 30 ml/min and above)**:** 200 units/kg sub-cutaneously once daily (100 units/kg twice daily in patients over 100kg) rounded to the nearest syringe size; reduced after 4 weeks to 150 units/kg, rounded to the nearest syringe size:

Patients weight (to nearest Kg)	Initial treatment dose	Reduced dose after 4 weeks of treatment**
Less than 45	7,500 units once daily	7,500 units once daily
45-56	10,000 units once daily	7,500 units once daily
57-68	12,500 units once daily	10,000 units once daily
69-82	15,000 units once daily	12,500 units once daily
83-100*	18,000 units once daily	15,000 units once daily
101-115*	10,000 units **twice** daily	18,000 units once daily
116-140*	12,500 units **twice** daily	Patients weighing 116-120kg: 18,000 units once daily Patients over 120kg: dose as advised by Haematologist
Over 140*	15,000 units **twice** daily	

* License for dalteparin states give 18,000 units to all patients 83kg and above
** Dose reduction after 4 weeks licensed in cancer patients only

Dose in patients with creatinine clearance between 20 & 29ml/min:

Patients weight (to nearest Kg)	Initial treatment dose
Less than 56	7,500 units once daily
57-68	10,000 units once daily
69-82	12,500 units once daily
83-100	15,000 units once daily
101-115	18,000 units once daily
116-140	10,000 units **twice** daily
Over 140	12,500 units **twice** daily

*** Unlicensed

Dose reductions after 4 weeks of treatment must be discussed on an individual basis with a Consultant Haematologist

Duration:

- First event 3-6 months as instructed
- Recurrent idiopathic event: long-term
- Ongoing risk-factors: consider continuing long-term if ongoing risk factor (e.g. cancer/ cancer therapies/very unstable oral anticoagulation- consider reducing to prophylactic dosages)

Treatment of venous thromboembolism in pregnancy (aged 16 years and older):
Dose: 200 units/kg sub-cutaneously daily, divided into 2 doses, rounded to the nearest syringe size. The dose is calculated using the booking weight and is **not** adjusted during the pregnancy:

Patients weight (to nearest Kg)	Initial dose	Once daily dose* (if applicable)
Less than 50	5,000 units twice daily	10,000 units once daily
50-64	7,500 units am & 5000 units pm	12,500 units once daily
65-79	7,500 units twice daily	15,000 units once daily
80-94	10,000 units am & 7500 units pm	18,000 units once daily*
95-109	10,000 units twice daily	[redacted]
110-124	12,500 units am & 10,000 units pm	
125-139	12,500 units twice daily	
140-154	15,000 units am & 12,500 units pm	
155-169	15,000 units twice daily	

*The dose in patients who weigh less than 90kg may be reduced following review by a Thrombosis Nurse Specialist or a Haematologist.
Duration: throughout pregnancy and for at least 6 weeks postpartum as advised by haematology/ obstetrics at joint clinic.

Prophylaxis of VTE

Prevention of VTE in high-risk surgical patients, those with a history of thrombosis associated with central venous access and certain cancer patients (aged 16 years and older):
Dose: Dosed according to weight:

Patients weight (to nearest Kg)	Dose	Dose if eGFR is less than20 mL/min/1.73m^2
Less than 45	2,500 units once daily	2,500 units once daily
45-99	5,000 units once daily	
100-149	7,500 units once daily	
150 or more	5,000 units **twice** daily	

Duration:

- High-risk patients usually receive a 28 course post-operatively or post-discharge (bariatric surgery patients receive a 10 day course post-discharge, fractured neck of femur patients receive a 28 day course post-operatively). Patients undergoing varicose vein surgery who have thrombosis risk factors receive a 10 day course post-operatively
- For other patients prophylaxis is continued for the duration of increased risk e.g. for the duration central line is in-situ

In pregnancy in the prevention of VTE or the management of the antiphospholipid syndrome (recurrent miscarriage/ adverse pregnancy outcome) (aged 16 years and older):
Dose: based on early pregnancy booking weight:

Patients weight (to nearest Kg)	Dose	Dose if eGFR is less than20 mL/min/1.73m^2
Less than 50	2,500 units once daily	5000 units once daily with anti-Xa monitoring (discuss with a haematologist)
50-90	5,000 units once daily	
91-130	7,500 units once daily	
131-170	10,000 units once daily	
Over 170	75 units/kg/day in 2 divided doses (rounded to nearest whole syringe)	

Duration: throughout pregnancy and for 6 weeks postpartum. Consideration can be given to stopping at term in antiphospholipid syndrome associated with recurrent miscarriages – as advised by Haem/Obs clinic.

Monitoring

Secondary care

- Baseline full blood count (FBC), coagulation screen, U&Es, LFTs, accurate body weight in all patients on dalteparin
- Check FBC 24 hours after starting LMWH and weekly for 2 weeks ONLY in patients who have had exposure to heparin/ LMWH or cardiopulmonary bypass surgery within the previous 100 days.
- Patients at risk of hyperkalaemia are to have their potassium level checked weekly for the first 2 weeks of dalteparin use

Primary care

- Check FBC 24 hours after starting LMWH and weekly for 2 weeks ONLY in high-risk surgical patients who have had exposure to heparin/ LMWH or cardiopulmonary bypass surgery within the previous 100 days.
- Check potassium level regularly according to clinical judgement if patient is at high risk of hyperkalaemia (i.e. patients with diabetes mellitus, chronic renal failure, acidosis, raised potassium levels, on potassium-sparing drugs, potassium supplements or on long-term dalteparin treatment)
- Re-weigh patients on dalteparin for treatment of VTE disease according to clinical judgement e.g. more often if rapid weight loss (e.g. cancer patients). Alter weight-adjusted doses as appropriate
- Monitor renal function and seek advice if deterioration becomes evident

Prescribing in Renal Impairment

Usually dalteparin is avoided in patients with a creatinine clearance less than 20mL/min. In selected patients it may be appropriate to continue with LMWH therapy and clear prescription guidance should be provided by secondary care with respect to dosage and monitoring. Any queries can be directed to Drs Maclean/ van Veen/ Saccullo as below.

Contra-indications to dalteparin

See current BNF (www.bnf.org) for comprehensive list or follow the link to the SPC above

Heparin Induced Thrombocytopenia (HIT)

It is only necessary to monitor for HIT in patients who have had exposure to heparin/ LMWH or cardiopulmonary bypass surgery within the previous 100 days. HIT usually presents between 5 and 14 days after starting therapy. This should be considered if platelet count falls below normal range, or to less than 30% of baseline platelet count. STHFT will undertake monitoring for HIT during first 2 weeks of VTE treatment with dalteparin, GPs should undertake HIT monitoring in high-risk surgical patients who are discharged on prophylactic dalteparin. HIT monitoring is not necessary in pregnant women on prophylactic dalteparin.

If patient develops thrombocytopenia, skin reaction or new thrombosis within 14 days of starting therapy, HIT should be considered. If HIT is suspected, discuss as an emergency with a Haematologist

Some common side-effects of dalteparin: (for full list follow the link to the SPC above)

- Hyperkalaemia: Heparin inhibits aldosterone secretion and may cause hyperkalaemia. Patients with diabetes, chronic renal failure, acidosis, raised potassium or taking potassium-sparing drugs or potassium supplements are most susceptible. The risk increases with duration of dalteparin therapy
- Haemorrhage
- Thrombocytopenia
- Injection site reactions (consider change to alternative low molecular weight heparin following discussion with On-call for Haematology)
- Osteoporosis with prolonged therapy
- Skin necrosis and hypersensitivity reactions

Drug interactions

See current BNF (www.bnf.org) for comprehensive list or follow the link to the SPC above

If any problems or concerns arise please contact the relevant specialist:

Consultant initiating dalteparin treatment (contact details on referral form / clinic letters)

On-call haematology SpR via RHH switchboard (including out of hours)	(0114) 2711900
Haematology consultants (Maclean/ van Veen/ Saccullo)	(0114) 2712500
Anticoagulant Clinic RHH:	(0114) 2713820

Sheffield Teaching Hospitals NHS
NHS Foundation Trust

DALTEPARIN SHARED CARE FORM

For all patients requiring ongoing dalteparin therapy: fax this referral to GP for ongoing prescription according to the Sheffield Dalteparin Shared Care Guideline

Not to be used for surgical patients being discharged on extended prophylaxis

ONLY if HIT monitoring is required* also fax this form to the STH anticoagulation clinic (fax no. 68690)

Name:

DoB:

Affix patient label here

Hosp No.:
NHS No.:
Consultant:

- Hospital to provide initial 28 day supply of dalteparin and to undertake heparin induced thrombocytopenia (HIT) monitoring* (repeat FBC weekly for 2 weeks) which is **ONLY** necessary if the patient has had exposure to heparin/ LMWH or cardiopulmonary bypass surgery within the last 100 days
- GP to continue prescribing and monitoring potassium levels, renal function and weight as appropriate
- Patient's medical care remains with the hospital consultant who initiated dalteparin
- Refer to a Consultant Haematologist for further thrombosis care where appropriate.

1) REFERRING CONSULTANT DETAILS

Referring consultant_____ NGH: ☐ RHH: ☐ WPH: ☐ JW: ☐

Consultant contact number_____ Fax number: _____

Next consultant clinic appointment _____ GP/practice receiving referral_____

2) INDICATION FOR DALTEPARIN

a) Thromboprophylaxis: In pregnancy ☐ Central line ☐ Cancer ☐

b) Deep vein thrombosis/ Pulmonary embolism: In pregnancy ☐ Injectable drug user ☐

Associated with cancer/ cancer therapies ☐ Unsuitable for oral anticoagulation ☐

3) TREATMENT INFORMATION

Patient's weight_____ (kg) Dose of dalteparin_____ units ONCE/TWICE daily *(delete as appropriate)* Date started_____

Intended dose changes (if on treatment dose, as per guideline):

Dose to change to _____ units ONCE/TWICE daily on _____
(delete as appropriate) *(date)*

Proposed duration of treatment

6 weeks ☐ 3 months ☐ 6 months ☐ long term ☐ Other duration ☐ (please give details):_____

Dalteparin to be administered by: Patient or carer ☐ Community Nurse (fax this form along with SPA referral) ☐

Further relevant information (clinical problems, concurrent medication):

4) MONITORING REQUIREMENTS

Is monitoring for hyperkalaemia required? Yes ☐ No ☐

i.e. does patient have diabetes mellitus, chronic renal failure, acidosis, raised potassium levels or are they on potassium-sparing drugs, potassium supplements or long-term dalteparin treatment?)

Baseline results

Creatinine:_____(µmol/L) Creatinine clearance:_____(mls/min) Platelets:_____($x10^9$/L) Potassium:_____(mmol/L)

FORM COMPLETED BY:

Signature: _____ Print name: _____

Designation: _____ Contact No.(bleep/ext.): _____ (RHH/NGH/WPH/JHW) Date: _____

Faxed by: _____ Time: _____ Date: _____

Received at GP practice by: _____ Time: _____ Date: _____

This referral has been made in line with the shared care guideline for dalteparin. Agreement to undertake shared care will be assumed unless the GP contacts the referring consultant to state otherwise.

Dear Dr……..

Regarding your patient:……

Following recent surgery, your patient will be at increased risk of venous thromboembolism.

In order to complete the recommendation of extended thromboprophylaxis following surgery (NICE 2010), we have provided your patient with a course of

dalteparin (Fragmin®)……. units to be given once/twice* daily for…....days post-operatively

*(*delete as applicable)*

Low molecular weight heparins such as dalteparin can cause Heparin-Induced Thrombocytopenia (HIT) in a very small number of patients. Those at highest risk are patients who have had exposure to heparin/LMWH or cardiopulmonary bypass surgery within the previous 100 days of starting LMWH. HIT is associated with a very high risk of thrombosis (venous or arterial) and should be considered a medical emergency.
In order to detect HIT it is necessary to check the platelet count and compare with the baseline. This is required weekly for the first 2 weeks of LMWH therapy.

The pre-operative baseline platelet count on …/…/… was ……

Your patient had surgery on …/…/…., and is being discharged on …/…/….

A full blood count is therefore required between …/…/… and …./…/…

*and a second between …/…/… and …/…/…

*(*delete as applicable)*

We would be grateful if you would obtain this/these sample(s) and continue to monitor this patient for HIT. If the platelet count falls by more than 30%, and/ or should the patient develop thrombotic symptoms such as, skin rash, or symptoms suggestive of DVT, PE (leg swelling / chest pain), or arterial thromboembolism, your local medical admissions unit or haematology service on call should be contacted without delay.

If you require further information, please do not hesitate to contact

Ward…….. …… Telephone……

Signature…….. …… Print name……

Designation…… Date……. Time…….

Authors: Rhona Maclean & Becs Walsh. Version 2 Updated June 2019 ; review date June 2021