General Principles: There is compelling data in the medical literature to support the safe and effective use of low molecular weight heparin in carefully screened patients for the treatment of deep vein thrombosis (DVT) in an outpatient setting. The safety and efficacy of outpatient treatment is supported by ACCP guidelines which recommend initial treatment of DVT at home over treatment in the hospital in appropriately screened patients. Patients should be screened for pain control, adequacy of home circumstances including support from family/friends, telephone service, and ability to return to hospital. The use of these guidelines will enhance the quality of care for your patients, as it will allow earlier discharge from the hospital and treatment of the patient in their familiar home environment. The protocols encourage early discharge to outpatient management of selected low risk patients with deep vein thrombosis. These guidelines are not intended either to replace clinicians’ judgment or to establish a protocol for all patients with a particular condition.

This guideline is based on: CHEST 2012 Supplement: Antithrombotic Therapy for VTE Disease which has been endorsed by the MSH Ambulatory Best Practices Committee.


Key Points:

1. LMWH or fondaparinux are appropriate parental therapy for home treatment of DVT.
2. LMWHs are anticoagulants and can cause bleeding. **The same precautions that apply to initiating Unfractionated Heparin (UFH) apply to using LMWH.**
3. Warfarin should be started the same day as parental anticoagulation. Parenteral anticoagulation should continue for a minimum of 5 days or until the international normalized ratio (INR) is 2.0 or above for at least 24 hours. Target INR is 2.5 with range of 2.0 to 3.0.
4. While weight-based dosing is recommended and blood testing is not usually recommended when treating a patient with LMWHs, there are some circumstances when monitoring is appropriate.
   - Patient who weigh less than 60 kg.
   - Patients who weigh more than 150 kg.
   - Therapy lasting more than 14 days
   - Patients who have a Creatinine clearance less than 30 ml/min
   - During Pregnancy. **Use of LMWH during pregnancy (FDA Category B in all trimesters) is also an instance where monitoring the therapeutic response is recommended.**
5. Monitoring LMWH is NOT done by measuring PTT. You must measure anti-Xa level in the blood. The target range for the anti-Xa level is 0.5-1.0 IU/ml when administering the dose twice daily. The sample should be drawn about 4 hours after administration of the LMWH.
6. Major hemorrhage can occur in 1-2% of patient treated with LMWH which is at a rate similar to that of UFH.
7. Thrombocytopenia can occur with LMWH. A platelet count should be checked at baseline and on days 3 and 5 of therapy. **Platelets should be checked twice weekly for patients on a prolonged course of LMWH.**
8. Patients with a history of antibody induced thrombocytopenia on UFH should not be treated with LMWH.
9. LMWHs are not fully reversible with protamine because of the differing chain lengths of the LMWH molecule. At present no other reversal agents are available.
10. LMWH and warfarin are recommended above rivaroxaban (Xarelto®), an oral factor Xa inhibitor, in the treatment of DVT, rivaroxaban is, however, an option for outpatient DVT treatment.
11. LMWH can be given as a once a day or twice a day regimen. Once a day is preferred if dosing is adequate (i.e., same total dose as BID regimen.)
12. Early ambulation is recommended over initial bed rest.
13. Compressive stockings are recommended for acute therapy and for post thrombotic (phlebitic) syndrome;

**TREATMENT:**

**Low Molecular Weight Heparin Dosing Guidelines**

Enoxaparin (Lovenox®) 1 mg/kg subcutaneously every 12 hours. Enoxaparin should be continued for a minimum of 5 days and until a therapeutic oral anticoagulant effect has been achieved (INR 2.0 to 3.0). The dosing interval should be modified for renal impairment (1 mg/kg daily for CICr <30) and monitoring anti-Xa level is recommended.

Dalteparin (Fragmin®) usual dose is 200 units IU/kg SC qDay. There are no specific guidelines for dose adjustment for renal impairment. Monitoring anti-Xa level is recommended. Alternatively use enoxaparin.

Tinzaparin (Innohep®) usual dose is 175 anti-Xa IU/kg of body weight, administered SC once daily for at least 6 days and until the patient is adequately anticoagulated with warfarin (INR at least 2.0 for two consecutive days). There are no specific guidelines for dose adjustment for renal impairment. Monitoring anti-Xa level is recommended. Alternatively use enoxaparin.

**Oral Factor Xa Inhibitor**

Rivaroxaban (Xarelto®) 15 mg po bid x 21 days, then 20 mg daily. Avoid the use of XARELTO® in patient with CrCl <30 mL/min for treatment of DVT (Manufacturer’s Dosing Guideline)

**DURATION OF TREATMENT**

<table>
<thead>
<tr>
<th>NO treatment</th>
<th>3 months</th>
<th>Extended/Lifetime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distal LE DVT, asymptomatic and IF doesn’t extend when followed with serial imaging. (Treat if extends.)</td>
<td>Distal LE DVT, symptomatic (regardless of cause), or extending asymptomatic</td>
<td>Unprovoked proximal LE DVT (if low or moderate bleed risk)</td>
</tr>
<tr>
<td></td>
<td>Surgery or risk-factor associated Proximal LE DVT (regardless of symptoms)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unprovoked proximal LE DVT if high bleed risk</td>
<td>Cancer-associated DVT or PE (LMWH preferred over warfarin)</td>
</tr>
<tr>
<td></td>
<td>Recurrent, unprovoked LE DVT or PE (high risk)</td>
<td></td>
</tr>
</tbody>
</table>

Page 2 of 5

Outpatient Treatment of DVT
© Copyright MedStar Health, 2013
Patient diagnosed with deep vein thrombosis

Does the patient have any of the following characteristics?
- Age <18 or >80
- Weight <60 kg or >150 kg (monitor Xa level outside these parameters)
- Pregnant or nursing
- History of heparin sensitivity or heparin induced thrombocytopenia
- Complicated or recurrent deep venous thrombosis or pulmonary embolism
- History of pulmonary embolism in the past 5 years
- Requiring dialysis
- Active PUD, active or recent bleeding, high risk for potential major bleed
- Known coagulopathy, thrombotic or bleeding disorder, platelets <100,000
- Intracranial neoplasm or sever hypertension (SBP>220 or DBP>120 mmHg)
- Recent trauma, stroke or epidural, neurosurgical, or cerebrospinal procedure
- Cirrhosis of the liver, acute CHF, elevated LFT’s or substance abuse
- Coexisting illness requiring hospitalization
- Hypercoaguable markers such as protein C or S or antithrombin deficiency

Consider outpatient or early discharge management

YES
- Treat initially as an inpatient

Obtain Baseline CBC, Platelet Count, PT/INR, and a PTT

Patient Education
- Teach patient or caregiver injection techniques for Lovenox (a patient education kit for Lovenox® with contains a guide for injection, videotape, dosing schedule, alcohol swabs, and a sharps container is available through Aventis 800-981-2491)
- Warfarin education: signs and symptoms of bleeding and drug and food precautions
- Symptoms of DVT: increased redness, warmth, or swelling of area, pain, decreased sensitivity of extremity
- Care instruction for DVT: elevate leg, avoid sitting or standing for long periods
- Instruct patient in purpose and use for TED stockings
- Symptoms of PE: shortness of breath, chest pain, hypotension, lightheadedness, rapid heartbeat.

Home Healthcare Referral
- Home nurse to inject if patient or caregiver is unable to
- PT/INR daily and CBC and platelet count every 3 days

Treatment
- Start simultaneously:
- Warfarin 5 mg daily or 2.5 mg daily if frail, elderly or liver impairment; subsequent doses based on INR
- Lovenox® 1mg/kg every 12 hours; use 1mg/kg daily if Creatinine clearance <30 ml/min (see order sheet for formula to calculate Creatinine clearance)
- Discontinue Lovenox® once INR is within therapeutic range (2-3) for 2 consecutive days
- Warfarin therapy should be continued for at least 3-6 months
- Monitor INR regularly while patient remains on warfarin
Sample Order Sheet

1. Obtain baseline labs on day 1: PT/INR, PTT, hematocrit, hemoglobin, platelets and creatinine.
2. Fecal occult blood test x 1
3. Patient weight _______________kg.
4. Start Lovenox® (enoxaparin)__________mg (1 mg/kg of actual body weight) every 12 hours subcutaneously for a minimum of 4 days, including previous days of IV heparin after warfarin started and until INR therapeutic for 2 consecutive days. Use 1 mg/kg once daily for ClCr < 30 ml/min. If patient on heparin, start Lovenox® one hour after discontinuing heparin infusion, round Lovenox® dose to the nearest 10 mg. Prefilled syringe sizes are are 60mg, 80mg, 100mg, 120mg and 150mg syringes
5. Initiate teaching of self-administrated subcutaneous technique by RN
6. Start warfarin ____________mg po daily. (Usual starting dose is 5 mg)
7. No IM Injections
8. No aspirin or NSAIDS unless specified here: _____________________________
9. Goal INR ________________ (normal goal range 2.0-3.0 for DVT)
10. TED (anti-embolism) stockings/ambulation early
11. At time of discharge:
   a. Routine labs: PT/INR daily, PTT, hematocrit, hemoglobin and platelets every 3 days while on enoxaparin. INR to be called to provider the same day before evening warfarin dose given.
   b. Arrange Home Health Care (HHC) visits for medication administration/monitoring as needed
   c. Discharge instruction by the nurse to include emphasis on the need for rapid transport to hospital ER if the patient has any signs of chest pain or shortness of breath
   d. Activity : check appropriate boxes
      ❑ bed rest with bathroom privileges
      ❑ limited ambulation
      ❑ driving privileges
      ❑ other
      ❑ no limitations

To calculate the creatinine clearance (in mL/min) use the following formula (Cockcroft-Gault):

\[
\frac{(140\text{-age})(\text{Ideal body mass in kg})}{72 \times \text{serum creatinine in mg/dL}}
\]

For female patients multiply the above result by 0.85
References


6. Manufacturer’s Dosing Guidelines

*Outpatient Treatment of Deep Vein Thrombosis with Low Molecular Weight Heparin (LMWH) Clinical Practice Guideline was initiated in 2004 by the MSH Ambulatory Best Practice Committee.*

*Clinical Guidelines are reviewed every two years by a committee of experts in the field. Updates to guidelines occur more frequently as needed when new scientific evidence or national standards are published.*