

# Comparing Unfractionate Heparin and Low Molecular Weight Heparins

	Low molecular weight heparins	Unfractionated Heparin (UFH)
Administration	DO NOT GIVE IM OR IV SC: given once or twice daily	DO NOT GIVE IM IV: administered as a continuous infusion as per institution-specific protocol SC: usually given two to three times daily
FDA approved uses	<ol style="list-style-type: none"> <li>1. Prevention of DVT in TKR/THR and abdominal surgery♣</li> <li>2. Prevention of DVT in medically ill patients<sup>^</sup></li> <li>3. Treatment of DVT with/without PE as inpatient*</li> <li>4. Treatment of DVT without PE as outpatient*</li> <li>5. Unstable angina/non-Q-wave MI <sup>^</sup></li> </ol>	<ol style="list-style-type: none"> <li>1. Prophylaxis and treatment of venous thrombosis and its extension, PE, peripheral arterial embolism, atrial fibrillation with embolization</li> <li>2. Diagnosis and treatment of acute and chronic consumption coagulopathies</li> <li>3. Prophylaxis for postoperative DVT and PE</li> <li>4. Clotting prevention in arterial and heart surgery, blood transfusions, extracorporeal circulation, dialysis procedures and blood samples</li> </ol>
Unlabeled uses	<ol style="list-style-type: none"> <li>1. Prevention of DVT in pregnant patients</li> <li>2. Treatment of asymptomatic PE as outpatient</li> <li>3. Bridging treatment of patients undergoing surgery on chronic warfarin therapy</li> <li>4. Prevention of DVT in trauma patients</li> </ol>	<ol style="list-style-type: none"> <li>1. Prophylaxis of left ventricular thrombi and cerebrovascular accidents post-MI</li> <li>2. Continuous infusion for treatment of myocardial ischemia in unstable angina refractory to conventional treatment. Intermittent heparin is not effective</li> <li>3. Prevention of cerebral thrombosis in stroke</li> <li>4. After thrombolytic therapy</li> </ol>
Usual Adult Maintenance Dose	<u>Prophylaxis:</u> Enoxaparin: SC.: 30 mg bid or 40 mg daily CrCl<30 mL/min = 30 SC daily Dalteparin 2500 – 5000 units SC daily <u>Treatment:*</u> Enoxaparin SC: 1 mg/kg*every 12 hours or 1.5 mg/kg one time daily CrCl<30 mL/min = 1 mg/kg SC daily *Based on total dry body weight	<u>Prophylaxis:</u> SC: 5,000 units every 8 to 12 hours <u>Treatment:</u> IV: doses should be titrated based on PTT
Time to Peak	SC: within 3 to 5 hours	IV: immediate SC: within 20 to 30 minutes
Monitoring	Labs: <i>Anti-Xa activity, Platelets</i> Bleeding, blood in urine/stool/vomit, bruising	Labs: <i>PTT, Platelets, Hematocrit, Hemoglobin</i> Bleeding, blood in urine/stool/vomit, bruising
When Should Labs Monitoring Efficacy be Drawn?	Anti-Xa levels should be drawn 4 hours after the dose is given **Not Routinely Done**	Continuous Infusion: 6 to 8 hours after rate changes Intermittent Infusion: 3.5 to 4 hours after dose
Miscellaneous	<ul style="list-style-type: none"> <li>◆ <b>Contraindicated in patients with a history of heparin induced thrombocytopenia.</b></li> <li>◆ <b>Caution in renal failure, guidelines available for enoxaparin only .</b></li> <li>◆ Derived from <b>pork</b> sources so caution with <b>allergies.</b></li> <li>◆ Caution in pregnancy.</li> </ul>	<ul style="list-style-type: none"> <li>◆ <b>Contraindicated in patients with a history of heparin induced thrombocytopenia.</b></li> <li>◆ Derived from <b>pork</b> or <b>beef</b> sources so caution with <b>allergies.</b></li> <li>◆ Safe in pregnancy and breastfeeding.</li> </ul>

<sup>^</sup>Enoxaparin and dalteparin

\*Enoxaparin only

♣Enoxaparin for both, dalteparin only for hip replacement

## **Why use LMWH over UFH?**

- Increased incidence of HIT with UFH compared to LMWHs. (see iceberg addendum)
- Increased potential for errors with UFH related to (all of these below have the potential for nursing/pharmacy/physician errors that can increase the risk of adverse events):
  - a. Infusion (LMWHs are used subcutaneously, no infusion done)
  - b. Bolus (LMWHs are used subcutaneously, no bolus done)
  - c. PTT monitoring (not done for LMWHs, rarely monitor with anti-Xa levels)
  - d. Calculation of doses (one time dosing calculation for treatment in LMWHs)
  - e. Varying concentrations
  - f. Vial sizes and concentrations (dose-specific pre-filled syringes)

## **Where are LMWHs contraindicated or not evaluated?**

- Dialysis
- Pregnancy and valves combined, individually accepted by specialists
- Extreme weights (<45kg and >155kg) accepted by specialists but not general clinicians
- Acute or chronic bleeding risks
- Antithrombin III deficiency (rare)
- Pulmonary embolism – hemodynamically unstable - depends on clinician
- HIT patients (contraindication for both LMWH and UFH)