Heparin IV Infusion Protocol and Orderset – Approved Changes

In 2014 a subcommittee of the UC Health Medication Safety Committee was formed to review heparin related medication incidents. The current heparin infusion protocols prescribing patterns, medication use process errors [e.g., prescribing, dispensing, administration, etc.], adverse drug events, and laboratory monitoring confirmation and validation have been carefully evaluated. Though several of these changes are not perfectly in line with practice guidelines, they have been carefully reviewed by several specialties and reflect current practice within UC Health. The following changes will go into effect July 7, 2015.

All heparin infusions with a concentration of 25,000 units / 250 mL will be ordered from the following orderset:

**Heparin Continuous Infusion Orderset:**
The nursing section received one additional order, otherwise unchanged.

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Indications/Contraindications will remain required, the contraindications will remain unchanged and additional indications will be added as noted below:

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1 of 1 selected

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1 of 1 selected

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Pre infusion labs will not change and the Labs section will have the stool guaiac removed:

You will see the most significant changes in the Medications section. There are three main protocols and a fixed dose infusion. The ability for the prescriber to set their own protocol in Epic has been removed. The following are screen shots from the new orderset. Each protocol easily identifies the target hPTT range and the preferred indications. Within each order set is the ability to order the initial bolus dose independent of the infusion and to order the infusion with or without adjustment boluses.

**Goal hPTT 90 – 130 seconds** (Standard Dose)
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<table>
<thead>
<tr>
<th>Suggested Indications for 90 to 130 seconds goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVT</td>
</tr>
<tr>
<td>PE</td>
</tr>
<tr>
<td>Arterial Thrombus</td>
</tr>
</tbody>
</table>

Goal hPTT 90-130 seconds (WITH ADJUSTMENT BOLUS) "Recommended For Most Patients" 0 of 2 selected

Goal hPTT 90-130 seconds (NO ADJUSTMENT BOLUS) 0 of 2 selected

Goal hPTT 90-130 seconds (WITH ADJUSTMENT BOLUS) "Recommended For Most Patients"

- INITIAL BOLUS: heparin (porcine) 80 units/kg IV once
  - 80 Units/kg, Intravenous, Once, Maximum initial bolus of 10,000 units
- heparin (porcine) infusion (WITH ADJUSTMENT BOLUS)

Goal hPTT 90-130 seconds (NO ADJUSTMENT BOLUS)

Goal hPTT 90-130 seconds (WITH ADJUSTMENT BOLUS) "Recommended For Most Patients"

- heparin (porcine) infusion 8,500 Units
  - 8,500 Units (rounded from 8,580 Units = 80 Units/kg = 107 kg), Intravenous, Every 6 hours PRN, For low hPTT = less than 36 seconds, Starting Today at 1830
  - Maximum initial bolus of 10,000 units
- heparin (porcine) infusion (WITH ADJUSTMENT BOLUS)
  - 8,500 Units (rounded from 8,580 Units = 80 Units/kg = 107 kg), Intravenous, Every 6 hours PRN, For low hPTT = less than 36 seconds, BOLUS 80 unit/kg (MAX 10,000 units) per hPTT goal 90-150 seconds protocol

And

- heparin (porcine) injection 4,500 Units
  - 4,500 Units (rounded from 4,280 Units = 40 Units/kg = 107 kg), Intravenous, Every 6 hours PRN, For low hPTT = 36 to 69 seconds, Starting Today at 1030
  - For low hPTT = 36 to 69 seconds, BOLUS 40 unit/kg (MAX 10,000 units) per hPTT goal 90-130 seconds protocol

And

- heparin 25000 units in 0.45% NaCl 250 mL IV infusion
  - 19.5 mL/hr (rounded from 19.26 mL/hr = 18 Units/kg/hr = 107 kg), Intravenous, Continuous, Starting Today at 1700

Goal hPTT 95-130 seconds hPTT < less than 36 seconds
  - BOLUS 30 unit/kg IV INCREASE dose by 4 units/kg/hour hPTT = 36 to 69 seconds: BOLUS 40 unit/kg IV
  - Decrease dose by 2 units/kg/hour hPTT = 80 to 90 seconds: NO bolus
  - CONTINUE current dose hPTT = 131 to 150 seconds: NO bolus
  - DECREASE dose by 2 units/kg/hour hPTT = greater than 150 seconds: HOLD infusion for 1 hour

HOLD infusion CALL Physician for further direction HIGH ALERT MEDICATION

Goal hPTT 80 – 110 seconds (Low Dose)

<table>
<thead>
<tr>
<th>Suggested Indications for 80-110 seconds goal</th>
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</thead>
<tbody>
<tr>
<td>Atrial Fibrillation</td>
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<tr>
<td>Acute Coronary Syndrome (Acute MI, Unstable Angina)</td>
</tr>
</tbody>
</table>

Goal hPTT 80-110 seconds (WITH ADJUSTMENT BOLUS) "Recommended For Most Patients" 0 of 2 selected

Goal hPTT 80-110 seconds (NO ADJUSTMENT BOLUS) 0 of 2 selected
Goal hPTT 60 – 80 seconds (Minimal Dose)

This is a new protocol that satisfies a therapeutic goal hPTT desired by numerous prescribers. It provides conservative dosing approach while adhering to the initial maximum rate of approximately 1,000 units per hour, yet eliminates the error-promoting maximum weight requirement of 83 kg.

In order to limit the initial rate to a maximum of 1,000 units per hour, the order is generated by selecting the weight range that is appropriate for the patient.
If the patient weighs 107 kg, choose the third option (101kg – 120kg) and the order is completed automatically using the weight in the Epic system.

Here is the breakdown of each weight category and the corresponding dosing weight:

<table>
<thead>
<tr>
<th>Weight Category</th>
<th>Initial Infusion Rate</th>
</tr>
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<tbody>
<tr>
<td>Less than 83 kg</td>
<td>12 units/kg/hour</td>
</tr>
<tr>
<td>83 kg – 100 kg</td>
<td>10 units/kg/hour</td>
</tr>
<tr>
<td>101 kg – 120 kg</td>
<td>8 units/kg/hour</td>
</tr>
<tr>
<td>121 kg – 140 kg</td>
<td>7 units/kg/hour</td>
</tr>
<tr>
<td>141 kg – 160 kg</td>
<td>6 units/kg/hour</td>
</tr>
<tr>
<td>161 kg – 180 kg</td>
<td>5 units/kg/hour</td>
</tr>
<tr>
<td>Greater than 181 kg</td>
<td>4 units/kg/hour</td>
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</tbody>
</table>
Fixed Dose Infusion
Prescriber is to order subsequent rate adjustments, additional boluses and appropriate labs as needed using standard order processes.

The prescriber must enter the desired dose and does not have the ability to change any of the administration instructions or add any order comments.

Finally two important items worth noting are that the dose is editable and is no longer fixed on any of the records and the weight as recorded in Epic is automatically pulled into the order. Both features are highlighted in yellow in the screenshot below. The editable dose field is desirable when infusions are being restarted after a procedure or upon transfer. The order can now be started at a specific dose that was at goal in the previous order. Populating the weight automatically removes the potential for weight entry errors and simplifies the ordering process by generating a complete order by simply checking the box next to the desired option.