Simulations for Clinical Excellence in Nursing Services

Infusion: Heparin

Insert photo here

Infusion: Heparin
Simulations for Clinical Excellence in Nursing Services

Instructor Information

Patient Name: Harrison, Betsy
Simulation Developer(s): Melissa Brickner, Bridgett Everett, Debra A. Mosley, Beverly Snyder-Desalles, and Judy Young

Scenario Purpose:
- To assist nursing staff to effectively initiate intravenous access and administer antibiotic infusion therapy

Learner(s):
- Registered Nurses (RN), Licensed Practical Nurses (LPN), Unlicensed Assistive Personnel (UAP)
- Others as desired, depending on facility protocols
- Recommend no more than 6 learners (3 of which can be observers)

Time Requirements:
- Setup: 5 minutes
- Scenario: 25 minutes
- Debrief: 25 minutes
- Reset/Breakdown: 5 minutes

Confederate(s):
- Clerk
- Dr. Santana – via telephone
- Family member

Scenario Prologue:
- Sixty-five (65) year-old female is directly admitted from the outpatient clinic for deep vein thrombosis and Heparin infusion. Patient is s/p right hip fracture with open reduction internal fixation (ORIF) three (3) weeks ago. She just returned from a ten (10) hour car trip. The time is 0700. The simulation begins when the learners are receiving report from the nurse

Patient information:
- General: Alert, oriented and calm
- Weight/Height: 81.8kg (180lbs) 177.8cm (70in)
- Vital Signs: BP 140/84; Temp 97; HR 92; RR 22; O2 Sat 97%
- Pain: 5/10 right lower extremity
- Neurological: Unremarkable
- Respiratory: Eupneic
- Cardiac: Unremarkable
- Gastrointestinal: Unremarkable
- Genitourinary: Unremarkable
- Musculoskeletal: Right calf red, swollen, and warm to the touch. Pulses +2 bilaterally.
- Skin: Redness on calf of right lower extremity

Past Medical History:
- Hypertension, hyperlipidemia, osteoarthritis, right hip fracture d/t fall three (3) weeks ago

Past Surgical History:
- Appendectomy, S/P open reduction internal fixation (ORIF) of the right hip three (3) weeks ago

Medications:
- Metoprolol 50mg one time daily
- Simvastatin 40mg in the evening
- Ibuprofen 400mg three times a day for pain

Allergies:
- No known drug allergies (NKDA)

Green Text Confederate
Red Text Physiology Change
Learning Objectives

Patient Name: Betsy Harrison

Simulation Developer(s): Melissa Brickner, Bridgett Everett, Debra A. Mosley, Beverly Snyder-Desalles, and Judy Young

Scenario Purpose:
- Assist nursing staff members with the initiating and managing Heparin infusion therapy

Pre-Session Activities:
- Complete pertinent training on Heparin infusion therapy
- Review any policies and protocols on Heparin infusion therapy

Potential Systems Explored:
- When should the healthcare provider anticipate the use of Heparin infusion therapy?
- What standardized protocols currently exist to establish the safe use of Heparin infusion therapy?
- When should the healthcare provider consider stopping a Heparin infusion?
- Which staff members are qualified to initiate Heparin infusion therapy?
- What facility specific documentation is required with Heparin infusion therapy?
- What risk factors, contraindications, and complications are important to consider when caring for the inpatient receiving Heparin Infusion therapy?
- How would the care differ for a patient receiving other types of anticoagulant therapy such as argatroban?

Scenario Specific Learning Objectives (Knowledge, Skills, and Attitudes = K/S/A):

**The learner will apply ICARE principles throughout the scenario**

Learning Objective 1: Initiate Heparin infusion therapy according to protocol
  a. K- Demonstrate knowledge of Heparin protocol
  b. S- Calculate patient specific bolus and infusion rate utilizing baseline information

Learning Objective 2: Monitor Heparin infusion therapy according to protocol
  a. S- Ensure lab draws are complete according to protocol
  b. S- Implement adjustments to Heparin Infusion therapy
  c. S- Perform a focused assessment
  d. S- Perform the appropriate interventions for the patient experiencing bleeding associated with Heparin infusion therapy
  e. S- Implement adjustments to Heparin infusion therapy according to protocol
  f. S- Recognize changes in the patient’s status

Learning Objective 3: Demonstrate effective communication when caring for the patient receiving Heparin infusion therapy
  a. S- Perform patient/family teaching
  b. S- Prioritize the communication of assessment findings, lab results, and Heparin Infusion therapy to the healthcare provider
  c. S- Complete facility specific documentation of actions taken pertaining to Heparin Infusion therapy

Debriefing Overview:
- Ask the learner(s) how they feel after the scenario
- Have the learner(s) provide a summary of the scenario from a healthcare provider/clinical reasoning point of view
• Discuss the scenario and ask the learners what the main issues were from their perspective
• Ask what was managed well and why.
• Ask what they would want to change and why.
• For areas requiring direct feedback, provide relevant knowledge by stating “I noticed you [behavior]...” Suggest the behavior they might want to portray next time and provide a rationale. “Can you share with us?”
• Indicate closing of the debriefing but provide learners with an opportunity to voice one or two take-aways that will help them in future practice
• Lastly, ask for any outstanding issues before closing the debrief

**Critical Actions/Debriefing Points:**
1. Verify orders
2. Perform patient/family teaching prior to initiating Heparin Infusion protocol
3. Obtain baseline information per Heparin Infusion protocol
4. Perform medication safety check with another RN per Heparin protocol
5. Perform rights of medication administration
6. Ensure antidote is readily available
7. Initiate Heparin therapy with initial bolus according to protocol
8. Assess bleeding lab draw site/blood on sheets and obtain vital signs
9. Stop Heparin Infusion per protocol for bleeding and high aPTT or Anti-Xa result
10. Notify healthcare provider of bleeding and high aPTT or Anti-Xa using ISBAR tool
11. Complete facility specific documentation
Simulations for Clinical Excellence in Nursing Services

Infusion: Heparin

Simulation Set-Up

Patient Name: Betsy Harrison (ALS Mannequin)

Simulation Developer(s): Melissa Brickner, Bridgett Everett, Debra A. Mosley, Beverly Snyder-Desalles, and Judy Young

Room Set-up:
- Set up like an inpatient room

Patient Preparation:
- The patient is wearing a hospital gown
- Saline lock is in place
- At 1330, lab draw site is bleeding and there is blood on the sheets from rectal bleeding (see flowchart)

Have the following equipment/supplies available:
- Gloves
- IV catheter
- Saline lock with female luer-lock adapter
- Tape or IV securing device
- Clear occlusive dressing
- IV label
- IV primary tubing (compatible with the pump)
- Male luer-lock adapter
- Bag for Heparin infusion (500mL or 250 mL bag)
- Medication label for Heparin
- Bloody 2x2 dressing for lab draw site (the family member will discretely apply at 1:30)
- Simulated blood in a small container or ziplock bag (the family member will discretely empty contents on the pad under patient at 1:30)
- IV pump

Medications:
- Heparin infusion
  **Calibration will be required if using radiofrequency identification (RFID)**

Note: 5.8 Simpad software update is required to load scenarios ([http://cdn.laerdal.com/downloads/f4343/simpad-upgrade_vs2](http://cdn.laerdal.com/downloads/f4343/simpad-upgrade_vs2))
Scenarios may be used with Laerdal or LLEAP software

Scenario Supplements:
- Confederate scripts
- Confederate name tags
- Patient Identification Band
- Medication label for Heparin infusion (facility specific-example provided)
- Nurse Driven Heparin Protocol (pages 1 and 2)
- PTT results
- Heparin protocol (facility specific-example provided)
- ZZ test patient/Demo patient in CPRS (if desired)
Sixty-five (65) year-old female inpatient was directly admitted from the outpatient clinic for deep vein thrombosis and Heparin infusion. Patient is s/p right hip fracture with open reduction internal fixation (ORIF) three (3) weeks ago. She just returned from a ten (10) hour car trip with complaints of right calf pain.

**AM**

- The Clerk provides the Registered Nurses (RN) with printed orders from CPRS to initiate Heparin Infusion therapy
- **Did not perform patient/family teaching or safety check***
  - Patient will become increasingly anxious stating "What is that? You can't just put medicine in my IV without telling me what it is! Do you know what you are doing?"
- **Status Change**
- SpO2: 92%
- BP: 100/62
- HR: 117
- RR: 24
- ECG: Sinus Tachycardia
- Eye: Open
- Pain level: 5/10 Right calf
- Skin: Pale
- Blood on sheets and blood draw site
- "Patient will become increasingly anxious stating "What is that? You can’t just put medicine in my IV without telling me what it is! Do you know what you are doing?"

**PM**

- The clerk will enter the room, distract the learner and hand him/her the aPTT result while the family member places the bloody lab draw dressing on the patient's arm and empties contents of simulated blood on bed pad under the sheets
- Patient states "Somebody came and drew my blood and now look at my arm! I need my sheets changed. They got wet after I went to the restroom."
- **Did not address lab results**
- SpO2: 89%
- BP: 88/48
- HR: 125
- RR: 26
- ECG: Sinus Tachycardia
- Skin: Pale, diaphoretic
- Clerk states "Dr. Santana is on hold for you."
- **Did not perform patient/family teaching or safety check***
  - Patient will become increasingly anxious stating "What is that? You can’t just put medicine in my IV without telling me what it is! Do you know what you are doing?"

**Critical Actions/Debriefing Points:**
- Verify orders
- Perform patient/family teaching prior to initiating Heparin Infusion protocol
- Obtain baseline information per Heparin Infusion protocol
- Perform medication safety check with another RN per Heparin protocol
- Perform rights of medication administration
- Ensure antidote is readily available
- Initiate Heparin therapy with initial bolus according to protocol
- Assess bleeding lab draw site/blood on sheets and obtain vital signs
- Stop Heparin infusion per protocol for bleeding and high aPTT or anti-Xa result
- Notify healthcare provider of bleeding and high aPTT or anti-Xa using ISBAR tool
- Complete facility specific documentation
- RN performs patient/family education regarding Heparin Infusion therapy
- RN verifies orders and initiates Heparin infusion protocol
- RN obtains baseline information per protocol
- RN performs safety check with another RN prior to initiating Heparin infusion
- RN performs rights of medication administration
- RN ensures antidote is readily available
- RN prepares infusion using aseptic technique
- RN administers Heparin bolus via pump
- RN initiates Heparin infusion via pump
- RN verbalizes time due for follow-up aPTT or Anti-Xa per Heparin protocol
- RN performs patient/family education regarding Heparin Infusion therapy
- RN verifies orders and initiates Heparin infusion protocol
- RN obtains baseline information per protocol

**Initial State:**
- Mental Status: Alert and oriented
- SpO2: 97%
- BP: 140/84
- HR: 92
- RR: 22
- ECG: Sinus Rhythm
- Eyes: Open
- Pain level: 5/10 Right calf
- Skin: Right calf red and swollen

**Status Change**
- SpO2: 26
- BP: 88/48
- HR: 125
- RR: 26
- ECG: Sinus Tachycardia
- Skin: Pale, diaphoretic

**Did not perform patient/family teaching or safety check***
- Patient will become increasingly anxious stating "What is that? You can’t just put medicine in my IV without telling me what it is! Do you know what you are doing?"

**Did not address lab results**
- SpO2: 89%
- BP: 88/48
- HR: 125
- RR: 26
- ECG: Sinus Tachycardia
- Skin: Pale, diaphoretic

**Did not wet sheets or bleeding blood draw site**
- SpO2: 89%
- BP: 88/48
- HR: 125
- RR: 26
- ECG: Sinus Tachycardia
- Skin: Pale, diaphoretic

**Red border incorrect action**

**Change in physiology**

**Simulations for Clinical Excellence in Nursing Services**

**Flowchart**
Supplements

Confederate Scripts
Confederate Name Tags
Patient Identification Band
Nurses Notes
Orders
Heparin Protocol Clinical Process Map Example
Nurse-Driven Heparin Protocol Example (pages 1 and 2)
Medication Label
Confederate Scripts

Betsy Harrison: Patient

**Medical/Surgical History:** Hypertension, hyperlipidemia, osteoarthritis, right hip fracture d/t fall three (3) weeks ago. Appendectomy, S/P open reduction internal fixation (ORIF) of the right hip three (3) weeks ago  

**Medications:**  
- Metoprolol 50mg one time daily  
- Simvastatin 40mg in the evening  
- Ibuprofen 400mg three times a day for pain  

**Allergies:** NKDA

- If the learner did not perform patient/family teaching or safety check, the patient will become increasingly anxious stating “What is that? You can’t just put medicine in my IV without telling me what it is! Do you know what you are doing?”
- After the clerk hands the learner(s) the aPTT results at 1:30, the patient will state “Somebody came and drew my blood and now look at my arm! I need my sheets changed. They got wet after I went to the restroom.”

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**Family Member**  
- At 1:30, the clerk will enter the room, distract the learner and hand him/her the aPTT result while the family member places the bloody lab draw dressing on the patient’s arm and empties contents of simulated blood on bed pad under the sheets

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**Clerk**  
- At 1:30, the clerk will enter the room, distract the learner and hand him/her the aPTT result while the family member places the bloody lab draw dressing on the patient’s arm and empties contents of simulated blood on bed pad under the sheets  
- Clerk will notify learner Dr. Santana is returning their call

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**Dr. Santana-Via telephone**  
- The learner(s) will place a call to Dr. Santana  
- Dr. Santana will state “Follow the Heparin protocol, I am getting off the elevator now. I will be there in a minute.”
Confederate Name Tags

- Betsy Harrison: Patient
- Clerk
- Family Member
- Dr. Santana – via telephone
Simulations for Clinical Excellence in Nursing Services

Infusion: Heparin

Patient Identification Band

Dr. M. Santana
Age: 65
000-00-0000
Allergic: NKDA

Harrison, Betsy
Nurses Notes

Date: Today
Patient Name: Betsy Harrison
Mode of Arrival: Personally owned vehicle
Accompanied by: Family member

Chief Complaint: Direct admit from the outpatient clinic for deep vein thrombosis and Heparin Infusion. Patient is s/p right hip fracture with open reduction internal fixation (ORIF) three (3) weeks ago. She just returned from a ten (10) hour car trip complaining for right calf pain.
Active Problems: Hypertension, hyperlipidemia, and osteoarthritis

Patient Information:
- General: Alert, oriented and calm
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- Vital Signs: BP 140/84; Temp 97; HR 92; RR 22; O2 Sat 97%
- Pain: 5/10 right lower extremity
- Neurological: Unremarkable
- Respiratory: Eupneic
- Cardiac: Unremarkable
- Gastrointestinal: Unremarkable
- Genitourinary: Unremarkable
- Musculoskeletal: Right calf red, swollen, and warm to the touch. Pulses +2 bilaterally.
- Skin: Redness on calf of right lower extremity
- Past Medical History: Hypertension, hyperlipidemia, osteoarthritis, right hip fracture d/t fall three (3) weeks ago
- Past Surgical History: Appendectomy, S/P open reduction internal fixation (ORIF) of the right hip three (3) weeks ago

Screen for Abuse/Neglect: N/A
Does the patient show any evidence of abuse? No
Does the patient feel safe in his/her current living arrangements? Yes
Suicidal or Homicidal Ideation in the past two weeks? No
Is the patient currently enrolled in primary care? Yes

Diagnostic Procedures Ordered:
( ) X-Ray
( ) Labs
( ) None
( ) EKG
( ) Head CT without contrast
( ) Other

Triage Classification: Emergency Severity Index
Patient Disposition: Medical-Surgical Unit
Signed by: /DM/

Medications:
- Metoprolol 50mg one time daily
- Simvastatin 40mg in the evening
- Ibuprofen 400mg three times a day for pain

Allergies:
- No known drug allergies (NKDA)
### Orders

#### Patient Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Harrison, Betsy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor</td>
<td>Dr. M. Santana</td>
</tr>
<tr>
<td>Age</td>
<td>65</td>
</tr>
<tr>
<td>Social Sec #</td>
<td>000-00-0000</td>
</tr>
<tr>
<td>Allergies</td>
<td>NKDA</td>
</tr>
<tr>
<td>Weight</td>
<td>81.8kg (180lbs)</td>
</tr>
<tr>
<td>Height</td>
<td>177.8cm (70in)</td>
</tr>
</tbody>
</table>

#### Diagnosis

| Diagnosis | Deep Vein Thrombosis |

#### Condition

| Condition | Stable                   |

#### Orders

| Orders | Initiate Nurse Driven Heparin Protocol |

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**DO NOT WRITE IN THIS SPACE**
Nurse-driven Heparin Infusion Protocol Clinical Process Map Example

Purpose:
1. Process to ensure accurate and safe Heparin Infusion administration
2. Standardize an aPTT time process that is congruent with lab processes and clinical practice to effectively track results
3. Nurses can confidently and skillfully manage Heparin Infusion protocol
4. Consistent with National Patient Safety Goal 03.05.01 – Improving the Safety of Using Medications

Licensed healthcare provider initiates Nurse Driven protocol

- Heparin orders verified by pharmacy
- Nurse reviews and verifies the order
- Nurse verifies baseline aPTT and platelet level
- Nurse calculates initial bolus and infusion rate based on protocol using a standardized tool (signature/initials required)
- Second Nurse calculates initial bolus and infusion rate using a separate tool (signature/initials required)
- Nurse documents initial bolus and infusion rate and time of initiation into template
- Patient education about IV Heparin completed
- Nurse administers appropriate bolus and infusion
- aPTTs are drawn by nurse at scheduled times
- aPTTs are run STAT by lab personnel and results available within one (1) hour
- Nurse review aPTT result and makes adjustments per Heparin Infusion Protocol
- If result is “critical, Nurse caring for patient is contacted by lab personnel, Nurse contacts healthcare provider using ISBAR format and makes adjustments per order
- Nurse completes “critical lab documentation”
Nurse-Driven Heparin Protocol Example (page 1)

Initiation of Heparin Therapy: Patient Admission (dry) Weight: _______ kgs

Date: _______
Time: _______

Nurse Initials: ______
2nd Nurse Initials: ______

NOTE: 2nd nurse must double check the 9 rights (Patient, Drug, Route, Time, Dose, Documentation, Action, Form, Response)

Adjust Heparin infusion using the following:
1. Obtain PTT q6h starting 6 hours \textit{after start of infusion} for 24 hours, or longer, or until two consecutive therapeutic PTTs are obtained
2. \textbf{Therapeutic range is 60-99}.
3. Thereafter obtain PTT daily for the duration of heparin therapy.
4. In addition, following ANY dose change draw PTT q6h until 2 consecutive therapeutic PTTs are obtained.

**It is important to remember that PTTs are drawn 6 hours from the time of the dose change – NOT 6 hours from the last PTT drawn.**

Maintenance of Heparin Therapy: ***NOTE:** If first PTT post-initiation or post-bolus is greater than 99, and there are no signs or symptoms of bleeding, DO NOT lower dose, as this PTT result may still reflect the bolus dose. Follow guidelines for subsequent PTT results.

### Heparin Infusion Dose Change Guidelines

<table>
<thead>
<tr>
<th>PTT (seconds)</th>
<th>Bolus (units)</th>
<th>Hold Infusion</th>
<th>Dose Change</th>
<th>PTT monitoring until 2 consecutive results are within therapeutic range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than or equal to 45</td>
<td>Repeat initial bolus</td>
<td>No</td>
<td>+3 units/kg/hr</td>
<td>Q6H</td>
</tr>
<tr>
<td>46 - 59</td>
<td>Give ½ initial bolus</td>
<td>No</td>
<td>+2 units/kg/hr</td>
<td>Q6H</td>
</tr>
<tr>
<td>60 - 99</td>
<td>0</td>
<td>No</td>
<td>No change</td>
<td>None</td>
</tr>
<tr>
<td>100 - 109</td>
<td>0</td>
<td>No</td>
<td>-1 unit/kg/hr</td>
<td>Q6H</td>
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<tr>
<td>110 - 127</td>
<td>0</td>
<td>Hold 30 minutes</td>
<td>-2 units/kg/hr</td>
<td>Q6H</td>
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<tr>
<td>(\geq 128) and/or comment of “unable to clot in 150 seconds”</td>
<td>0</td>
<td>Hold and call MD</td>
<td>Per MD</td>
<td></td>
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<td></td>
<td></td>
<td>Redraw if necessary</td>
<td>(Typically Provider will hold x1 hour then decrease dose -3units/kg/hr and recheck in 4-6 hours)</td>
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</tbody>
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Initials | Signature | Initials | Signature
### Nurse-Driven Heparin Protocol Example (page 2)

#### Labs
<table>
<thead>
<tr>
<th>Date/Time Drawn</th>
<th>PTT results (seconds)</th>
<th>Bolus Given</th>
<th>Dose (units/kg/hr)</th>
<th>Time of dose change</th>
<th>Initials</th>
<th>2(^{nd}) Nurse initials</th>
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<tbody>
<tr>
<td><strong>First PTT</strong></td>
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#### Initials

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**IMPRINT PATIENT DATA CARD (Name, Address and Social Security No.)**

**MEDICAL RECORD**

**NURSING DOCUMENTATION**
Medication Label

- Name
- ID
- Drug
- Conc
- Dose/vol
- Route
- Date/Time
- Exp.
References


