Insert photo here

Infusion: Heparin

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
   S- *Calculate patient specific bolus and infusion rate utilizing baseline information*
b. ***S***- *Initiate Heparin bolus and set infusion rate based on baseline assessment and patient 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*
   A- *Exhibit a sense of urgency while maintaining a composed demeanor*
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

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
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)

Simulations for Clinical Excellence in Nursing Services

Infusion: Heparin

Flowchart

Initial State:
- Mental Status: Alert and oriented
- Sp02: 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

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***

- ***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***

*****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?"**

PM

****Status Change****
- Sp02: **92%**
- BP: **100/62**
- HR: **117**
- RR: **24**
- ECG: **Sinus Tachycardia**
- Eyes: Open
- Pain level: 5/10 Right calf
- Skin: **Pale**
- **Blood on sheets and blood draw site**

- ***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."***
- ***RN performs hand hygiene and puts on PPE***
- ***RN notes bleeding from lab draw site and blood on sheets from rectal bleeding***
- ***RN obtains vital signs and performs focused assessment***
- ***RN recognizes elevated aPTT and follows Heparin protocol***
- ***RN stops Heparin infusion***
- ***RN places a call to Dr. Santana***

*****Did not note wet sheets or bleeding blood draw site*****
Sp02: 89%
BP: 88/48
HR: 125
RR: 26
ECG: Sinus Tachycardia
Skin: Pale, diaphoretic

- ***Clerk states "Dr. Santana is on hold for you."***
- ***RN picks up the phone and performs ISBAR communication***
- ***Dr. Santana states "Follow the Heparin protocol, I am getting off the elevator now. I will be there is a minute."***
- ***RN verifies the orders***
- ***RN completes facility specific documentation***

*****Did not address lab results*****
Sp02: 89%
BP: 88/48
HR: 125
RR: 26
ECG: Sinus Tachycardia
Skin: Pale, diaphoretic

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

Confederate

Change in physiology

Red border incorrect action

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."**

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**

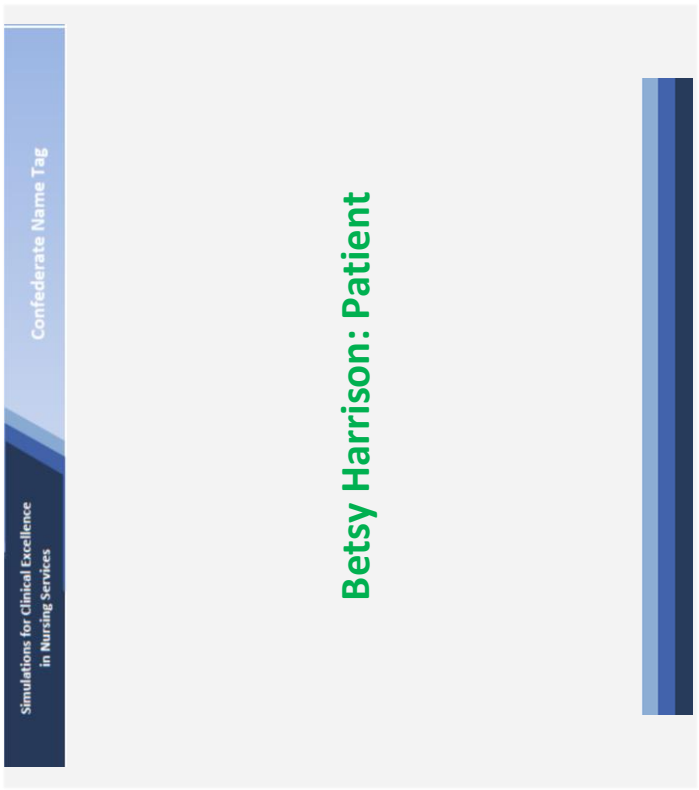
Clerk

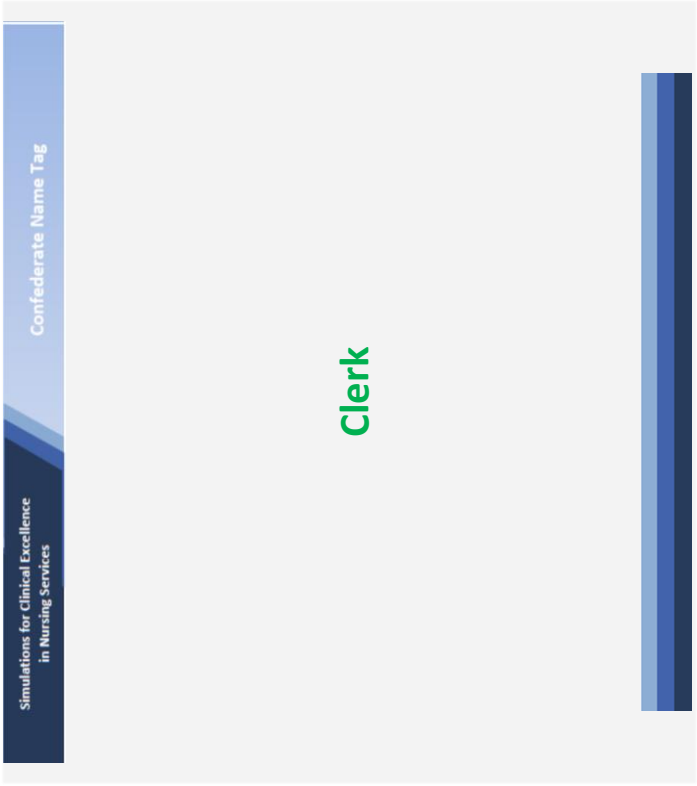
- **At 1:30, the clerk will enter the room, distract the learner and hand him/her the aPTT result while the family member places the bloody lab draw dressing on the patient's arm and empties contents of simulated blood on bed pad under the sheets**
- **Clerk will notify learner Dr. Santana is returning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

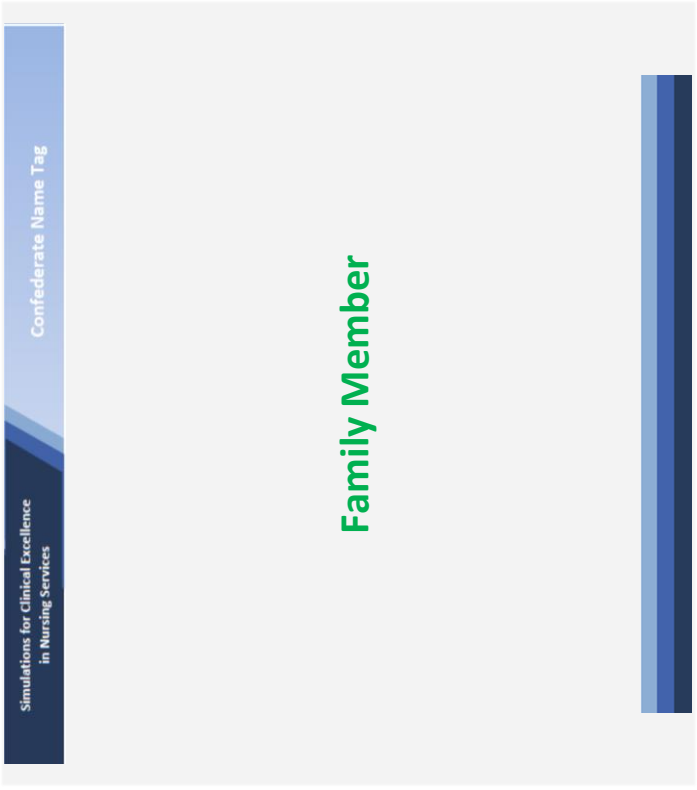
Dr. Santana-Via telephone

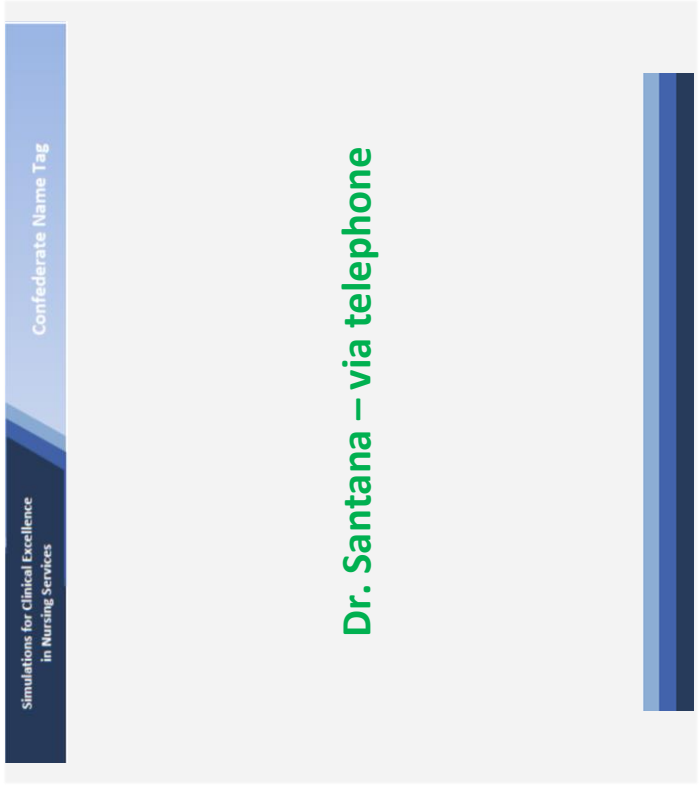
- **The learner(s) will place a call to Dr. Santana**
- **Dr. Santana will state "Follow the Heparin protocol, I am getting off the elevator now. I will be there is a minute."**

Confederate Name Tags

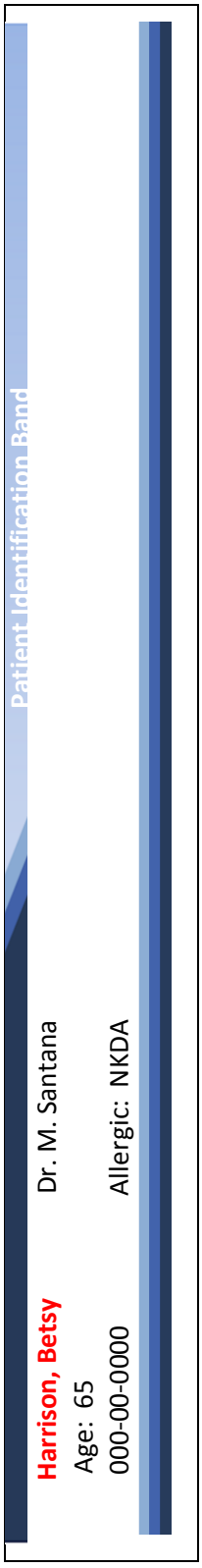








Patient Identification Band



Nurses Notes

Insert picture of patient here

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
- ***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)

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/

Orders

Patient Information

Harrison, Betsy
Dr. M. Santana
Age: 65
Social Security #: 000-00-0000
Allergies: NKDA
Weight: 81.8kg (180lbs)
Height: 177.8cm (70in)

Diagnosis	Deep Vein Thrombosis
Condition	Stable
Orders	Initiate Nurse Driven Heparin Protocol

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:_____

- **Initial Bolus Dose:** 80units/kg = ____ units
  Rounded to nearest 500 Units
  (Not to exceed 10,000 units for any patient)
- **Initial Infusion Dose: 18 units/kg/hr then adjust per chart below.**
  (20,000 units per 500 ml D5W)

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 ***after start of infusion*** for 24 hours, or longer, or until two consecutive therapeutic PTTs are obtained
2. **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

PTT (seconds)	Bolus (units)	Hold Infusion	Dose Change	PTT monitoring until 2 consecutive results are within therapeutic range
Less than or equal to 45	Repeat initial bolus	No	+3 units/kg/hr	Q6H
46 - 59	Give ½ initial bolus	No	+2 units/kg/hr	Q6H
60 - 99	0	No	No change	None
100 - 109	0	No	-1 unit/kg/hr	Q6H
110 - 127	0	Hold 30 minutes	-2 units/kg/hr	Q6H
≥128 and/ or comment of "unable to clot in 150 seconds"	**0 Verify sample is not from contaminated line**	**Hold and call MD Redraw if necessary**	Per MD (Typically Provider will hold x1 hour then decrease dose -3units/kg/hr and recheck in 4-6 hours)	

Initials	Signature	Initials	Signature

Nurse-Driven Heparin Protocol Example (page 2)

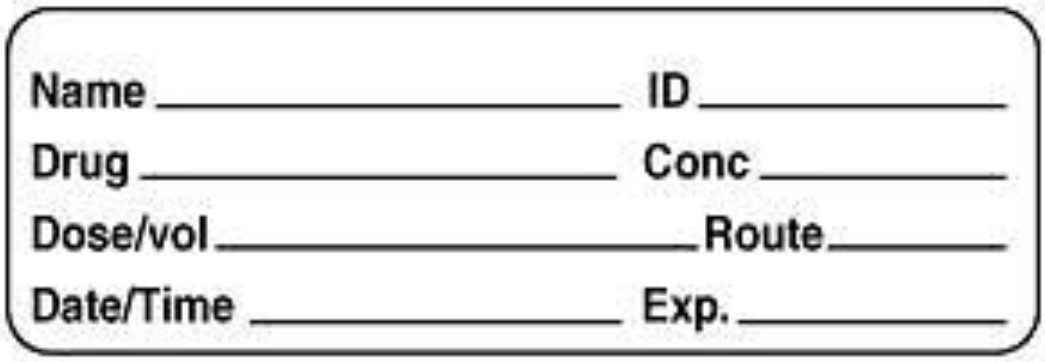
IMPRINT PATIENT DATA CARD (Name, Address and Social Security No.)	**MEDICAL RECORD** **NURSING DOCUMENTATION**

Labs	Date/Time Drawn	PTT results (seconds)	Bolus Given	Dose (units/kg/hr)	Time of dose change	Initials	2nd Nurse initials
First PTT							
Second PTT							
Third PTT							
Fourth PTT							
PTT							
PTT							
PTT							
PTT							
PTT							
PTT							
PTT							
PTT							
PTT							
PTT							
PTT							
PTT							

Initials	Signature	Initials	Signature

IMPRINT PATIENT DATA CARD (Name, Address and Social Security No.)	**MEDICAL RECORD** **NURSING DOCUMENTATION**

Medication Label



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