

Improving the Safety of Anticoagulation Therapy

--A Program for Nurses

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Some content adapted from article by Richard Ridge,
PowerPoint for US Military Hospitals, and the Anticoagulation
Safety Principles at Rochester Health Commission.

Objectives

By completion of this module, the nurse will be able to:

1. Describe the MUHA plan for compliance with the Joint Commission National Patient Safety Goal 3E on anticoagulation therapy.
2. Review the indications for, the food and drug interactions, the adverse effects, and reversal agents for 3 common anticoagulant medications.
3. List 4 safety tips for nurses who administer anticoagulants.
4. Identify information to be taught to patients and/or families regarding anticoagulation therapy.

2008 National Patient Safety Goal (NPSG) Goal 3E

- Goal 3 Improve Safety of Using Medications
 - Requirement 3E
Reduce the likelihood of patient harm associated with the use of anticoagulation therapy.

Why is NPSG 3E Necessary?

- Anticoagulation is a high risk treatment, which commonly leads to adverse drug events due to the complexity of dosing these medications, monitoring their effects, and ensuring patient compliance with outpatient therapy.

Anticoagulation Therapy Statistics

- Anticoagulants are one of the top 5 drug types associated with patient safety incidents.¹
- Heparin ranks 3rd in reported products involved in harmful errors, warfarin ranks 6th and enoxaparin ranks 9th.²
- Enoxaparin was involved in 4 of the 17 medication-related deaths reported to MedMarx in 2005.²
- Heparin errors typically involve infusion pump and parenteral delivery errors.³

1. Cousins D et al. 2006. Risk assessment of anticoagulation therapy. National Patient Safety Agency. United Kingdom.
2. USP MedMarx data, 2006.
3. Fankos J. et al. Medication errors associated with anticoagulation therapy in the hospital. Am J Cardiol. 2004; 94:532-5.

What does Joint Commission recommend?

- The use of standardized practices that include patient involvement can reduce the risk of adverse drug events associated with the use of heparin (unfractionated), low molecular weight heparin (LMWH), warfarin, and other anticoagulants.

MUHA Anticoagulation Program

- Standardize physician orders for anticoagulation medication
- Educate clinical staff on the adverse effects of anticoagulation medication
- Educate patients and families on anticoagulation therapy including awareness of adverse effects


MUHA Clinical Policy C156

- Beginning January 2009, Policy C156 will provide guidelines for:
 - prescribing of medical treatments and laboratory tests
 - dispensing of anticoagulant medication via unit-dose or commercially packaged products (if feasible)
 - monitoring of clinical status (laboratory values)
 - monitoring of food-drug, drug-drug, and drug-lab interactions
 - patient/family education

New Standardized Orders

- All anticoagulation orders will be written in the standardized format
- The standardized order form will indicate
 - Indication for therapy
 - Recommended dosing
 - Frequency of laboratory monitoring (INR)
 - INR goal for each patient

Sample Anticoagulant Order

 Warfarin Physician Orders Inpatient Services (MUHA, ART, IOP) Page 1 of 1 Form Origination Date: _____ Version: _____ Version Date: _____	<p style="color: red;">This form may be completed on line. Tab or move cursor to text field and type in text.</p> <p style="color: blue;">For HIPAA Compliance reasons, this form IS NOT TO BE SAVED with patient information. Selecting the PRINT button will clear all information from the note.</p> <p>Patient Name _____ MRN _____ PATIENT IDENTIFICATION LABEL</p>
ALLERGIES/DRUG SENSITIVITY: 1. _____ 2. _____ 3. _____ 4. _____	
Patient Weight <u> </u> kg <input type="checkbox"/> INR Goal = 2-3 <input type="checkbox"/> INR Goal = 2.5-3.5 <input type="checkbox"/> INR Goal = <u> </u> to <u> </u>	
Indications for Warfarin Initiation / Resumption of Therapy (check all that apply)	
<input type="checkbox"/> Atrial fibrillation / atrial flutter	
<input type="checkbox"/> Venous thromboembolism (deep vein thrombosis / pulmonary embolism)	
<input type="checkbox"/> Mechanical/Prosthetic Heart valves – Type _____ Position _____	
<input type="checkbox"/> Arterial thromboembolism (stroke)	
<input type="checkbox"/> Other indications _____ (examples includes antiphospholipid antibody syndrome, Type II heparin-induced thrombocytopenia)	
Warfarin Dose **** <input type="checkbox"/> New start – Please consult PharmD to counsel****	
<input type="checkbox"/> Warfarin 1 mg PO <input type="checkbox"/> today only <input type="checkbox"/> Daily at 1800	
<input type="checkbox"/> Warfarin 2.5 mg PO <input type="checkbox"/> today only <input type="checkbox"/> Daily at 1800	
<input type="checkbox"/> Warfarin 5 mg PO <input type="checkbox"/> today only <input type="checkbox"/> Daily at 1800	
<input type="checkbox"/> Warfarin <u> </u> mg PO <input type="checkbox"/> today only <input type="checkbox"/> Daily at 1800	
<input type="checkbox"/> Warfarin <u> </u> mg _____	
<input type="checkbox"/> Warfarin <u> </u> mg _____	
Laboratory Values – Monitoring Plan	
Admission INR _____ Last INR _____	
<input type="checkbox"/> If not drawn on current visit, please draw with AM labs (physician order).	
<input type="checkbox"/> INR daily <input type="checkbox"/> INR once weekly (minimum for patients stabilized on warfarin therapy)	
<input type="checkbox"/> INR _____	
Clinical Practice Points	
1. Consult with your clinical pharmacist regarding potential drug-drug, drug-food, and drug-laboratory interactions between warfarin and agents your patient may be on. Significant drug-drug interactions include; amiodarone, fluconazole, antiepileptics, rifampin, dual antiplatelet therapy, sulfamethoxazole-trimethoprim (Bactrim®).	
2. Refer to home Medication Reconciliation Database Admission Physician Orders for home medications.	
3. Bridging of warfarin with unfractionated heparin, fondaparinux, or low molecular weight heparins. For most patients on overlapping (bridging) therapy with warfarin, such therapy occurs for at least 5 days until therapeutic INR measurements are reached. Please refer to <i>Chest</i> supplement / Volume 133/Number 6/June 2008 for the latest treatment guidelines.	
4. Warfarin patient education should begin as soon as possible once it is determined that the patient is a candidate for outpatient warfarin therapy.	
5. **For monitoring, there are patients at higher risk of bleeding (eg dual antiplatelet therapies), therefore consider INR checks daily.**	
Physician Signature _____ Pager ID _____ Date _____ Time _____ AM/PM	

Question 1

Statistics indicate that the following is true of anticoagulants:

- a. As a drug category, one of the top 5 drug types associated with patient safety incidents.
- b. Heparin ranks 3rd in reported products involved in harmful errors, warfarin ranks 6th and enoxaparin ranks 9th.
- c. Enoxaparin was involved in 4 of the 17 medication-related deaths reported to MedMarx in 2005.
- d. All of the above

Question 2

MUHA's plan to meet Joint Commission recommendations includes:

- a. Standardize physician orders for anticoagulation medication
- b. Educate clinical staff on the adverse effects of anticoagulation medication
- c. Educate patients and families on anticoagulation therapy including awareness of adverse effects
- d. All of the above

Question 3

All anticoagulant orders must be written in a standardized format.

- 1. True
- 2. False

Ella Says

- I know this is tedious but it's very important!



Indications for Anticoagulation Therapy

- Anticoagulants are commonly ordered for treatment of
 - dysrhythmias, especially atrial fibrillation
 - valve surgery with implementation of mechanical valvular prosthesis
 - pulmonary embolism and venous thromboembolism
- Duration of treatment varies depending upon the disease state

Common Anticoagulants/Reversal Agents

- Anticoagulant: Coumadin (warfarin)
 - Reversal Agent: Vitamin K
- Anticoagulant: Heparin
 - Reversal Agent: protamine sulfate
- Anticoagulant: Low Molecular Weight Heparin (LMWH)/ Lovenox (enoxaparin)
 - Reversal Agent: protamine sulfate

Warfarin Drug-Drug Interactions

- Many drugs interact adversely with warfarin. Here are some examples:
 - herbal medications: ginkgo, ginseng, herbal teas
 - nutritional supplements: Ensure®, Sustacal®, Slim-Fast®, mega doses of vitamins
 - over-the-counter medications: aspirin, cimetidine, Pepto-Bismol®
 - NSAIDs: ibuprofen, naproxen
 - prescription drugs: antibiotics, steroids, amiodarone, chemotherapy agents

Food–Drug Interactions

- Coumadin (warfarin)
 - Keep diet *CONSISTENT*
 - A change in diet may impact warfarin levels
 - Significantly reducing food intake or anorexia will affect warfarin levels

Food-Drug Interactions

- Coumadin (warfarin)
 - Foods that affect warfarin levels are primarily those high in vitamin K. Vitamin K lowers warfarin levels. Foods with high levels of vitamin K:
 - green, leafy vegetables
 - green tea contains high levels of vitamin K and should be avoided
 - Alcohol can decrease or increase warfarin levels. Limit alcohol intake to two drinks per week.
 - Many nutritional supplements contain vitamin K and can interfere with warfarin levels (Ensure®, Sustacal®, Slim-Fast® etc.).

Importance of Medication Reconciliation

- It is important that you are aware that anticoagulation is a *high risk* treatment, which commonly leads to adverse drug events
- Maintaining a complete and accurate list of the patient's medications is key in *preventing drug-drug and drug-food interactions*
- The medication reconciliation process is in place to prevent adverse drug events

Patient Monitoring

- Labs: Required prior to initiation and during anticoagulation therapy. The most common labs used for monitoring anticoagulation therapy include, but are not limited to the following:
 - PTT - Heparin
 - PT/INR- Coumadin (warfarin)
 - Serum Creatinine - Low molecular weight heparin (LMWH) /Lovenox (enoxaparin)

Patient Complications

- May be related to either excessive or inadequate anticoagulation
- Adverse events that may occur include:
 - Stroke
 - Pulmonary embolism
 - Excessive bleeding
 - Deep vein thrombosis

Signs and symptoms of potential complications may include:

- Excessive or unusual bleeding or bruising
- Chest pain
- Shortness of breath
- Headache, dizziness, weakness
- Sudden changes in vision
- Swelling, pain, redness or warmth in arm or leg

While the patient is in the hospital, ask the patient or family to report any of these signs and symptoms to a nurse or physician.

Safety Tips for Nursing

- All anticoagulation medication are high risk and must include an independent double check before administration
- Never rely on the color and size of the vial and labeling. Read the label carefully!
- Check appropriate lab results before giving meds (for example INR, PT, PTT or serum creatinine).
- Know what the reversal agents are and how to give them before the time they might be needed!

Question 4

Protamine sulfate is the reversal agent for warfarin.

- a. True
- b. False

Question 5

Drugs that may interact adversely with anticoagulants include:

- a. Nutritional supplements
- b. Aspirin and NSAIDs
- c. Steroids
- d. All of the above

Question 6

Foods that may increase or decrease warfarin levels include:

- a. Collards
- b. Alcoholic beverages
- c. Ensure®
- d. All of the above

Question 7

Patient complications may result from either excessive or inadequate anticoagulant medication.

- a. True
- b. False

Question 8

Who is responsible for monitoring therapeutic lab levels during anticoagulation therapy?

- a. Physicians
- b. Pharmacists
- c. Nurses
- d. All of the above

Patient and Family Education

- Patient and family education is an important aspect of anticoagulation therapy
- Education is multidisciplinary and should be provided by nurses, pharmacists, dietitians, physicians
- Pharmacists should be contacted to counsel all patients placed on anticoagulants for the first time

Patient/Family Education

- Prior to discharge the patient and family should be instructed on*
 - Medication dosage including missed doses
 - Drug information/interactions (including herbals)
 - Dietary interactions (consistency with Vitamin K foods)
 - Signs/symptoms of bleeding and when to call physician or seek emergency care
 - Importance of monitoring INR or other labs
 - Duration of therapy

*remember to contact pharmacy if patient has not been on anticoagulants previously

Patient Education Resources

- Individual videos for warfarin, enoxaparin and fondaparinux are available on the GetWell Network®

Patient education materials on anticoagulants are available

- Education is documented on the Interdisciplinary Patient/Family Education Record in ClinDoc and Practice Partner.

Question 9

Patient education includes instructions for actions to take if a dose is missed.

- a. True
- b. False

Question 10

Pharmacists should be consulted to counsel patients who are being placed on anticoagulant therapy for the first time.

- a. True
- b. False

Congratulations!

- You have completed the module on Improving the Safety of Anticoagulation Therapy

