Project Submission:
2009 Delaware Valley Patient Safety Award

HAHNEMANN UNIVERSITY HOSPITAL

"Anticoagulation Task Force:
Successes and Lessons Learned"

Abstract

Anticoagulation Task Force: Successes and Lessons Learned

An interdisciplinary anticoagulation task force was initiated in our institution in October, 2008. The group consisted of physicians, pharmacists, dietitians, nurses and nursing educators. The primary goals of the task force were to ensure compliance with the Joint Commission's National Patient Safety Goal for Anticoagulation and provide safe and effective anticoagulation therapy at our hospital. The task force was successful in achieving numerous accomplishments within a short period of time. Fifteen policies and procedures were written and approved, including policies for general anticoagulation therapy, warfarin use and dosing, reversal of elevated INRs (International Normalized Ratio), direct thrombin inhibitors, VTE (Venous Thromboembolism) prevention and anticoagulation education. An on-line mandatory education training program for anticoagulation therapy was developed and implemented. Members of the task force developed and distributed a medical and surgical VTE risk assessment tool for physicians. Educational programs on anticoagulation were provided during a nursing lecture and an Internal Medicine Quality Improvement conference. Two heparin-dosing nomograms were developed and are in the process of being incorporated into our computerized physician order-entry system. A four-page warfarin teaching pamphlet was designed and printed to be used for patients being discharged on this medication. Baseline data was collected to determine how quickly patients on heparin infusions were achieving therapeutic aPTTs (activated partial thromboplastin times) and how physicians were dosing warfarin. These performance improvement measures will be re-assessed once all interventions have been implemented to improve anticoagulation practices at the institution.

Application/Entry:

Anticoagulation Task Force: Successes and Lessons Learned

An interdisciplinary anticoagulation task force was assembled and held an initial meeting in October, 2008. The group was coordinated by the Clinical Director of Pharmacy, and members included physicians, pharmacists, dietitians, nurses and nursing educators. The primary goal of the task force was to ensure that the hospital was compliant with the Joint Commission's National Patient Safety Goal (NPSG) for Anticoagulation. The Joint Commission also issued a Sentinel Event Alert in September, 2008 to prevent errors related to anticoagulation therapy. These two initiatives were the starting-point for the task force's initiatives.

At the first meeting of the task force, the group reviewed each element of performance of the NPSG and discussed which were currently being met at the hospital, and which required further efforts to meet. They developed a time-line and assigned responsibility for various tasks. The initial goal of the committee was to develop policies and procedures for safe anticoagulation use at the hospital. Several members of the Pharmacy Department drafted policies and procedures for the following: warfarin (Coumadin®) use and dosing, anticoagulation reversal, enoxaparin (Lovenox®) dosing and use, fondaparinux (Arixtra®) use, argatroban dosing and monitoring, lepirudin (Refludan®) dosing and monitoring, anticoagulation policy for inpatients, heparin dosing and adjustment, prophylactic anticoagulation, and anticoagulation education. These policies and procedures were reviewed by task force members and approved through the Pharmacy and Therapeutics Committee and Medical Executive Committee. The Vice President of Medical Affairs distributed a letter to all attending medical staff and all resident staff about the importance of safe anticoagulation practices and directed them to review the policies. All nurse managers in the hospital were also made aware of these new policies. A clinical pharmacist was invited to a Department of Medicine Quality Conference to discuss the safe use of anticoagulants. Topics discussed included the Joint Commission Patient Safety Goal, new policies and procedures, and the importance of VTE prophylaxis in hospitalized patients.

Two quality improvement studies were conducted to obtain baseline data pertaining to anticoagulation practices at our hospital. Task force members decided to collect data for time to therapeutic aPTT (activated partial thromboplastin time) and monitoring lab values with heparin infusions and warfarin dosing practices. Data for both studies were collected by clinical pharmacists. The heparin study results (appendix A) demonstrated that there was a very wide range of initial heparin doses since there was no consistent heparin dosing nomogram used at the hospital. The average time to achieve a therapeutic aPTT was 20.3 hours. Thirty five percent (35%) of patients did not achieve a therapeutic aPTT within 24 hours. Ninety six percent (96%) of patients had a daily complete blood count (CBC) while on heparin therapy. After reviewing the data collected, members of the task force believed that implementing standardized weight-based heparin dosing nomograms would lead to achieving therapeutic aPTTs in a more timely manner.

Results of the warfarin study (Appendix B) demonstrated that warfarin appeared to be dosed daily based on International Normalized Ratio (INR) in 68% of patients. Ninety seven percent (97%) of patients had INR checked daily while receiving warfarin. Only 21% of patients on warfarin received information about potential food-drug interactions. The Dietary Department has refined it report that identifies patients in the hospital who are receiving warfarin, and dietitians will visit these patients and review possible food-drug interactions. They utilize written material that is left with each patient (Appendix C). Results of both studies were reported to the Anticoagulation Task Force, Pharmacy and Therapeutics Committee and the Medicine Performance Improvement Committee.

An on-line anticoagulation training program had been developed by our corporate education department. The training included modules and post-tests on heparin and low molecular weight heparin (LMWH) and VTE prevention. One of the nursing educators on the task force along with a clinical pharmacist reviewed these modules and customized them to our hospital's practices. Several groups of health care professionals, including physicians, pharmacists and nurses have been assigned these modules for completion.

Members of the task force spent a significant amount of time developing methods and practices for Venous Thromboembolism (VTE) prevention. A risk assessment tool for medical (Appendix D) and surgical patients (Appendix E) was developed and distributed to physicians. The risk assessments and recommendations for prophylaxis were based upon the most recent CHEST Guidelines (Antithrombotic and Thrombolytic Therapy: American College of Chest Physicians Evidenced-Based Clinical Practice Guidelines 8th edition). A clinical pharmacist provided an educational lecture to nurses entitled "VTE and Anticoagulation." The lecture provided information about risk factors for VTE, appropriate prophylaxis with mechanical and/or pharmacological therapy, anticoagulation task force activities and accomplishments, and new anticoagulants on the horizon. In addition, the Pharmacy Department and Quality Department developed a poster board (Appendix F) that was displayed in the cafeteria for DVT (Deep Vein Thrombosis) awareness month this past March. The poster was displayed by pharmacists who spoke to visitors and health care workers about the importance of DVT prevention. The anticoagulation task force members requested that reminder screens be added in our Computerized Physician Order Entry (CPOE) system that prompts physicians to assess and provide prophylaxis for patients at risk of VTE when they are admitted to the hospital. In the future, we would like to develop ordering pathways for VTE prevention.

A team of pharmacists and physicians was assembled to discuss the feasibility of developing standardized weight-based heparin nomograms (Appendix G and H) at our institution. Two nomograms were subsequently developed; one low-dose/cardiac protocol and one more aggressive blood clot treatment protocol. These nomograms include dosing and monitoring parameters for patients on IV heparin therapy. The protocols will be incorporated into the physician ordering pathway in our CPOE system in the near future.

Task force members believe that is important for prescribers to have current INR results prior to entering orders for warfarin. We have requested from our CPOE programmers that the latest INR result and date automatically appear when an order is entered for warfarin therapy. Our new warfarin policy states that both physicians and nurses should check INR at the time of ordering and administration of warfarin. After much discussion about warfarin teaching materials, task force members decided to create a patient-friendly warfarin teaching brochure (Appendix I) that is available on all nursing units and in an electronic format on every computer in the hospital. Our patient discharge document was revised to include a check-off box when warfarin teaching has been completed.

The anticoagulation task force at our institution has been extremely successful at achieving its goals in a relatively short period of time. Numerous policies and procedures were developed and approved, baseline quality data was obtained, extensive education pertaining to anticoagulation was provided, and patient education materials were devised and distributed. We are planning to re-assess performance improvement measures related to heparin and warfarin therapy once all processes have been implemented.

Appendix A (Heparin Study)

Pharmacy – Heparin Drips

Source: Patient charts/Computer Orders

Benchmarks:
►Achieve therapeutic aPTT within 24 hours of beginning infusion
►100% daily CBC while on heparin drip

Source: Raschke RA, Reilly BM, Guidry JR, et al. The weight-based heparin dosing nomogram compared with a "standard care" nomogram. Ann Intern Med 1993;119:874-81
CHEST Guidelines 2008

Background: 24 patients on heparin drips were identified from October 20-27, 2008.

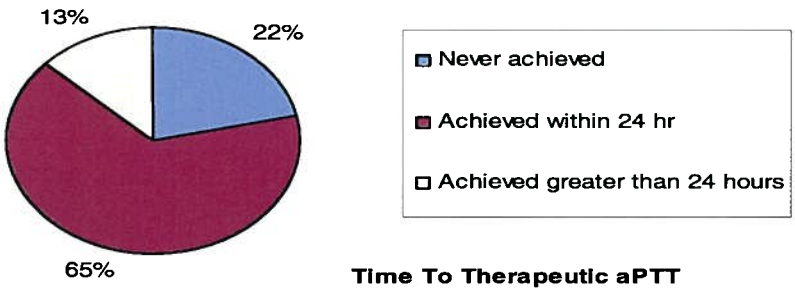
Conclusion/Recommendation:
►Wide range of initial infusion dose/rate
►Average time to therapeutic aPTT=20.3 hrs
►8/23 (35%) did not achieve therapeutic aPTT in 24 hours
►96% of patients had daily CBC
►2/17 (12%) used library pump feature

Action:
►Discuss results at Anticoagulation Task Force
►Attempt to standardize heparin nomograms

Analysis: Standardizing weight-based heparin infusion nomograms will achieve therapeutic aPTTs in a more timely manner.

Follow up: P&T Committee, Anticoagulation Task Force, Medical Executive Committee, Nurse Practice Council

PIC: no further recommendations



Appendix B (Warfarin Study)

Source: Patient charts/interview/Computer Orders

Benchmarks:
▶Warfarin dosed daily based on INR
▶INR checked daily until stabilized
▶Patients receive education on food/drug interactions

Source: CHEST Guidelines 2008; Joint Commission National Patient Safety Goal for Anticoagulation

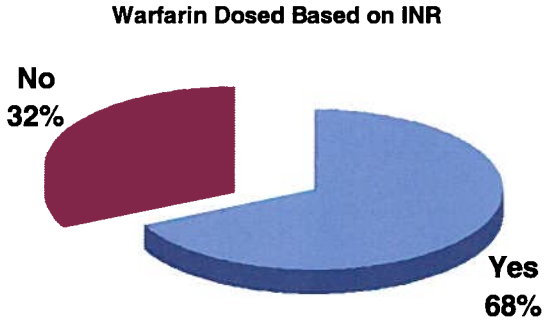
Background: 29 patients on warfarin during November 2008

Conclusion/Recommendation:
▶Warfarin dosed daily based on INR: 19/28 (68%)
▶INR checked daily: 28/29 (97%)
▶Received dietary info: 6/29 (21%)
▶Pharmacist counseled patient: 6/29 (21%)

Action:
▶Discuss results at Anticoagulation Task Force
▶Policy for warfarin therapy developed
▶Develop educational material for patient/family
▶Include INR documentation in Invision warfarin order (exploring possibility)

Analysis: INRs are being ordered routinely for patients on warfarin and doses are being adjusted accordingly. Patients are not routinely receiving dietary counseling. Pharmacists took opportunity to counsel patients during study period.

Follow up: Anticoagulation Task Force, Medical Executive Committee, Nurse Practice Council



Appendix C (Dietary Teaching Material)

Hospital
Warfarin (Coumadin) and Food Interactions

What is Coumadin?

Coumadin is a "blood thinner" medication that prevents blood clotting.

What is Vitamin K?

Vitamin K helps your blood to clot and can interfere with the "blood thinning" action of Coumadin

Will this affect my diet?

Most people who take Coumadin can eat a normal diet, but it is important to eat a **CONSISTENT** amount of vitamin K **DAILY**.

What foods are high in vitamin K?

If these foods are included **regularly** in your diet, you should continue to eat them **daily** in **consistent amounts.**

Broccoli
Brussels Sprouts
Cabbage
Collard Greens

Kale
Lettuce (all types)
Mustard Greens
Parsley (large amounts)

Spinach
Turnip Greens

Green Teas

AVOID CRANBERRY JUICE.

Can I take vitamin supplements?

Be aware of vitamins that contain vitamin K or large amounts of Vitamin E or C. Talk to your health care provider if you have any questions or concerns.

When should I contact my doctor?

Contact your doctor if you experience any of the following:

- Unusual bleeding or bruising
- Red or black tarry stools
- Dark brown urine
- Headache, dizziness, weakness
- If you are taking any herbal teas or herbal products

NOTES:

Appendix D (VTE Risk Assessment Medical Patients)

Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE) Prophylaxis

PROPHYLAXIS FOR MEDICAL PATIENTS page 1

PROPHYLAXIS FOR SURGICAL PATIENTS page 2

ABSOLUTE CONTRAINDICATIONS TO PHARMACEUTICAL ANTICOAGULATON SHOULD BE DOCUMENTED IN CHART

Active bleeding/hemorrhage
Recent hemorrhagic stroke
Bleeding in past 6 months

Active peptic ulcer disease
Heparin induced thrombocytopenia (HIT)
Hypersensitivity to heparin, enoxaparin or any of its components
Lumbar puncture

Thrombocytopenia
Platelets <50,000/mm or platelet dysfunction
>3 major falls in last 6 months or recurrent, injurious falls
Planned invasive procedure or major surgery
Epidural anesthesia/catheter with in 12hrs
Uncontrolled hypertension

Recent thrombolytics

RISK ASSESSMENT—add points associated with patient risk factors and order appropriate prophylaxis

Acute infection (1)	Nephrotic syndrome (1)	Age 61-74 (2)	Inherited/acquired thrombophilia (3)
Age 40-60 (1)	Obesity (1)	COPD (2)	CHF or MI (3)
Central venous catheter (1)	Pregnancy or post partum (1)	Immobility (2)	Ischemic stroke or stroke with paralysis (5)
Varicose veins (1)	Sepsis (1)	Age >75 (3)	Major trauma (5)
Estrogen use (1)	Malignancy and/or chemotherapy (2)	Family history of VTE (3)	Spinal cord injury (5)
Inflammatory bowel disease (1)	Acute respiratory failure (2)	History of VTE (3)	Admitted to ICU (5)

RISK SCORE

LOW RISK 1	MODERATE RISK (2-4)	HIGH RISK (≥ 5)
Early ambulation	Heparin every 8 hrs or enoxaparin with or with out pneumatic compression devices **OR** Pneumatic compression devices	Heparin every 8 hrs or enoxaparin **AND** pneumatic compression devices

MUST have baseline CBC with platelets prior to initiation of therapy
Baseline platelet count _____

Patient considerations
Oncology patients—enoxaparin—preferred agent
Dialysis or CKD—heparin—preferred agent

Heparin 5000 units subcutaneous every 8 hours
Enoxaparin (Lovenox) 40 mg subcutaneous every 24 hours (CrCl ≥30 mg/dl)
Enoxaparin (Lovenox) 30 mg subcutaneous every 12 hours (Trauma patients only)
Enoxaparin (Lovenox) 30 mg subcutaneous every 24 hours (CrCl <30 mg/dl)

Monitoring
Daily CBC with platelet count x2 days then every 3 days

Appendix E (VTE Risk Assessment Surgical Patients)

DVT Prophylaxis for Surgical Patients

High Risk General and Vascular Surgery Patients.
Pharmacological Prophylaxis ordered within 24hrs of surgery end time if:

- Surgical time is greater than 60 minutes **AND** length of stay is greater than 3 post operative days. Day of surgery is post operative day 0.

Contraindications to pharmacological prophylaxis must be clearly documented in the chart.

Moderate Risk General and Vascular Surgery Patients.
GYN, Urology, Intracranial Neurosurgery Patients.
SCD ordered within 24hrs of surgery end time if:

- Surgical time greater than 60 minutes **AND** length of stay is greater than 3 post operative days. Day of surgery is post operative day 0.

Any surgical patient with additional risk factors for DVT should be considered for pharmacological prophylaxis regardless of surgery time or post operative length of stay.

- Age greater than 60 years old
- Major trauma
- Cancer
- Previous DVT/PE
- Immobility
- Multiple medical illnesses
- Obesity
- Inflammatory bowel disease
- Nephrotic syndrome
- Inherited or acquired thrombophilia

Patients who receive a blood transfusion with in 24 hours prior to incision through 24 hours after incision are automatically excluded from pharmacological prophylaxis for DVT prevention.

Appendix F (VTE Prevention Poster Display)

What Is DVT?

•Deep Vein Thrombosis (DVT)

•A clot that forms in the blood vessels, usually a large vein

•Can partially or completely block the vein

•Can result in death

Statistics

•2 million Americans suffer from DVT yearly

•Up to 600,000 people are hospitalized in the U.S. for DVT

•300,000 die from pulmonary embolism (PE)

•More people die in the U.S. from PE than breast cancer and AIDS combined

Risk Factors

•Cancer
•Prior DVT
•Certain heart or respiratory diseases
•Age
•Acute illness with restricted mobility
•Genetics
•Hospitalization
•Major surgery such as hip, knee or joint replacements
•Pregnancy
•Restricted mobility from long-distance travel
•Use of birth control pills
•Postmenopausal hormone therapy
•Trauma
•Obesity

Complications of DVT

•Pulmonary embolism (PE)

–When a small piece of the clot breaks off and lodges into the lungs

•Postthrombotic syndrome

–When a clot remains too long in the vein

–Causes damage to the vein

–Blood can pool in the leg

Symptoms

•Pain
•Swelling
•Tenderness

•Discoloration or redness of the affected area
•Skin that is warm to the touch
•Up to 50% of all DVTs produce no symptoms or are completely "silent"

•Chest pain or discomfort
–pain or discomfort usually gets worse when you take a deep breath or when you cough
•Unexplained shortness of breath ~the most common symptom
•Feeling lightheaded or dizzy, or fainting
•Coughing up blood
•A sense of anxiety or nervousness

Prevention

•Compression stockings

•Foot/leg pumps

•Leg elevation

•Ambulation/exercise

•Heparin

•Low-molecular weight heparin

–Enoxaparin (Lovenox®)

Appendix G (Heparin Nomogram Aggressive)

Aggressive/Treatment Heparin Protocol
80 units/kg bolus + 18 units/kg/hr
Therapeutic Goal: 72-103 sec. based on heparin correlation curve

□No bolus dose necessary
□Bolus dose: 80 units/kg IV push (maximum 10,000 units)
Heparin Nomogram – pt. care order
□Give bolus, change heparin rate or hold infusion based on nomogram
□While on heparin obtain daily Hgb, HCT and PLT
□Monitor patient for signs/symptoms of bleeding
□Heparin 25,000 units/250mL D5W
□Begin infusion at 18 units/kg/hr max 2,000 units/hr
□aPTT 6 hours after heparin bolus
□aPTT 6 hours after change in heparin drip rate
□Order aPTT every 24 hours after 2 consecutive aPTTs therapeutic
□Call MD for: epistaxis, hematuria, gum bleeding
□Call MD for: hematemesis or GI bleeding
□Call MD for: hypotension (BP <100mmHG)
□Call MD for: decrease in Hgb>2gm% or PLT <100,00/mm or 50% decrease in PLT from baseline
□Call MD for: puncture site bleeding
□Call MD for: unrelieved headache
□Call MD for: patient fall
□No IM injections while on heparin
□For aPTT <54 sec: Rebolus 80 units/kg and increase infusion by 4units/kg/hr
□For aPTT 55-71 sec: Rebolus 40 units/kg and increase infusion by 2 units/kg/hr
□For aPTT 72-103 sec: NO CHANGE - THERAPEUTIC
□For aPTT 104-129 sec: Decrease infusion 2 units/kg/hr
□For aPTT >130 sec: Hold drip x 1 hour and decrease by 3 units/kg/hr
□For aPTT>150 sec, hold drip x 2 hours and decrease by 3 units/kg/hr

Appendix H (Heparin Nomogram Low-Dose)

Low Dose/Cardiac Heparin Protocol
60 units/kg bolus + 12 units/kg/hr
Therapeutic Goal = 1.5-2 times upper normal population range (37.1 sec)

□No bolus dose necessary
□Bolus dose: 60 units/kg IV push (maximum 5,000 units)
Heparin Nomogram – pt. care order
□Give bolus, change heparin rate or hold infusion based on nomogram
□While on heparin obtain daily Hgb, HCT and PLT
□Monitor patient for signs/symptoms of bleeding
□Heparin 25,000 units/250mL D5W
□Begin infusion at 12 units/kg/hr max 1,000 units/hr
□aPTT 6 hours after heparin bolus
□aPTT 6 hours after change in heparin drip rate
□Order aPTT every 24 hours after 2 consecutive aPTTs therapeutic
□Call MD for: epistaxis, hematuria, gum bleeding
□Call MD for: hematemesis or GI bleeding
□Call MD for: hypotension (BP <100mmHG)
□Call MD for: decrease in Hgb>2gm% or PLT <100,00/mm or 50% decrease in PLT from baseline
□Call MD for: puncture site bleeding
□Call MD for: unrelieved headache
□Call MD for: patient fall
□No IM injections while on heparin
□For aPTT <40 sec: Rebolus 60 units/kg and increase infusion by 4units/kg/hr
□For aPTT 40-55 sec: Rebolus 30 units/kg and increase infusion by 2 units/kg/hr
□For aPTT 56-74 sec: NO CHANGE - THERAPEUTIC
□For aPTT 75-99 sec: Decrease infusion 2 units/kg/hr
□For aPTT >100 sec: Hold drip x 1 hour and decrease by 3 units/kg/hr

Appendix I (Warfarin Teaching Brochure)

Maintain a Consistent Diet of Green Leafy Vegetables Which Have a High Vitamin K Content

Foods	*Portion Size*
Broccoli (raw & cooked)	1/2 cup
Brussel sprouts	5 sprouts
Cabbage (raw)	1 ½ cups
Collard greens	½ cup chopped
Green scallion	⅔ cup chopped
Kale (raw leaf)	⅝ cup
Lettuce (raw, bib, read leaf)	1 ¾ cups
Mustard greens	1 ½ cups
Spinach	1 ½ cups
Turnip greens	1 ½ cups
Tea (green)	1 cup

Before Leaving the Pharmacy With Your Warfarin Medication, Check the Following

- Color of pill-Each color represents a certain dose of warfarin. Ask your pharmacist about any change in the color of your pill.
- Milligram dose of pill
- Number of tablets in the bottle
- Number of tablets to take each day

Tell Your Doctor Before Starting Warfarin if You Have Any of the Following Conditions

- Fall frequently
- Have liver or kidney problems
- Have bleeding problems
- Have high blood pressure
- Have congestive heart failure
- Have diabetes
- Drink alcohol (including beer)
- Are pregnant or planning on becoming pregnant-Warfarin can cause harm to an unborn baby
- Are breastfeeding-Warfarin may increase bleeding in your infant. Talk to your doctor about how to best breastfeed your child.

Notify Your Doctor Immediately if You Have Any of the Following Symptoms

UNUSUAL OR UNEXPLAINED BLEEDING

- Bleeding from the mouth or gums; blood in the stool (red, pink or black stools); pink, red or brown urine; vomiting or coughing up blood or coffee-ground material; heavier than normal menstrual or vaginal bleeding; nosebleeds; cuts that take longer than usual to stop bleeding.

PAIN, SWELLING OR DISCOMFORT

HEADACHES, DIZZINESS OR WEAKNESS

UNUSUAL BRUISING

- Bruising that cannot be explained or grows in size

SKIN NECROSIS OR GANGRENE

- Call your doctor immediately if you have any change in the color or temperature of your skin, or have pain. Necrosis or gangrene is death of skin tissue

Helpful Hints For the Safe Use of Warfarin (Coumadin®)

Warfarin (Coumadin®)-What You Should Know

- What is Warfarin?-A drug that is used as a "blood thinner" to decrease the chance of forming a clot.
- Warfarin interacts with many drugs, including many prescription, OTC (over-the-counter) medications, vitamins and herbals; therefore, it is important that your doctor/pharmacist knows about all medications that you take.
- Warfarin needs to be monitored carefully. This is done by a lab test that measures INR. Your doctor will determine your goal INR and make adjustments from the results. The INR lets your doctor know how fast your blood clots. The goal for INR is usually 2-3, but your doctor will determine what is appropriate for you. It is important to keep all your appointments for lab tests.
- Take your warfarin at about the same time every day. You can take it with or without food.
- If you forget to take a tablet, call your doctor or pharmacist. Do *NOT* take another pill to "catch up" a dose.
- Keep a list of all your medications with you and show it to your pharmacist or doctor.
- Tell your healthcare provider, including your dentist, if you have any surgery or medical/dental procedures planned.
- Let your healthcare provider know right away if you fall or injure yourself, especially if you hit your head.
- Consider carrying a card in your wallet and wearing a medical alert bracelet stating that you are taking warfarin (Coumadin®)
- Do *NOT* start any new medications, herbal treatments, vitamins or over-the-counter (OTC) drugs without telling your doctor or pharmacist. Your dose may need to be changed.
- Do *NOT* take warfarin if you are pregnant or plan to become pregnant. Warfarin can harm your baby.
- Do *NOT* stop taking your medications until you talk to your doctor.
- Do *NOT* eat large amounts of green, leafy vegetables. Green, leafy vegetables contain vitamin K, which can affect how warfarin works. Eat a normal, balanced diet. Eat a consistent amount of green, leafy vegetables.
- Avoid large amounts of cranberry juice or cranberry products. Cranberries may affect how warfarin works in your body.
- Avoid drinking alcohol. It can lead to increased bleeding. Contact your physician or pharmacist for specific questions.

MEDICATIONS KNOWN TO INTERACT WITH WARFARIN

Prescription drugs:

- **Do *NOT* take prescriptions for both Warfarin and Coumadin. They both contain the same active drug (warfarin), and can cause increased bleeding.**
- Many prescription medications can affect how your body responds to warfarin.
- Check with your healthcare provider about the other medications you are taking.

Non-prescription drugs:

- Many non-prescription medications, such as aspirin and ibuprofen can affect how warfarin works and your response to warfarin.
- Do *NOT* take aspirin without first talking to your doctor.
- Tell your doctor if you are on any of these medications: Excedrin, Alka-seltzer, Bayer, Bufferin, Ecotrin, Empirin, Nyquil, PeptoBismol, Kaopectate, Motrin, Advil, ibuprofen, Nuprin, Aleve.
- Refer to your doctor or pharmacist for additional OTC pain medications that can interfere with warfarin.

Herbal products:

Many common herbal products can affect how warfarin works and your response to warfarin. Below is a short list, but refer to your doctor or pharmacist for a more complete list:

- Alfalfa
- Capsicum
- Celery
- Chamomile
- Clove
- Dandelion
- Fenugreek
- Feverfew
- Garlic
- Ginger
- Ginkgo biloba
- Ginseng
- Goldenseal
- Horse chestnuts
- Horseradish
- Licorice
- Onion
- Parsley
- Sweet clover
- Tamarind
- Wintergreen
- Yarrow