

**Central State Hospital
Plan**

SUBJECT: **USE OF ANTICOAGULANT MEDICATIONS**

ANNUAL REVIEW MONTH: November

RESPONSIBLE FOR REVIEW: Chief Medical Officer

LAST REVISION DATE: November 2010 (New)

- I. Anticoagulants that may be ordered at Central State Hospital (CSH)
 - A. Two anticoagulants may be ordered at Central State Hospital:
 1. Enoxaparin Sodium (Lovenox) injection, hereafter referred to as Enoxaparin
 2. Warfarin Sodium (Coumadin) tablets, hereafter referred to as Warfarin
 - B. The use of any anticoagulant not listed above must first have the approval of the Clinical Director *and* the Pharmacy Director (or designee) before the order is written. When writing such an order, the order writer will state this approval in writing on the order.

- II. Risk factors for major bleeding in clients receiving anticoagulation therapy
 - A. Initiation of therapy (first few days and weeks)
 - B. Anticoagulation intensity (e.g., INR > 4.0) and/or duration (e.g. long duration Warfarin therapy)
 - C. Unstable anticoagulation response
 - D. Concurrent anti-platelet drug or NSAID use
 - E. History of gastrointestinal bleeding
 - F. Hypertension
 - G. Age > 65 years
 - H. Recent surgery or trauma
 - I. Fall
 - J. Heavy alcohol use
 - K. Chronic liver disease
 - L. Renal failure
 - M. Cerebrovascular disease
 - N. Malignancy

- III. Enoxaparin Sodium (Enoxaparin)
 - A. Description
 1. Enoxaparin is low molecular weight heparin (LMWH) with antithrombotic properties.

2. Thrombin is crucial for the formation of fibrin, and fibrin is the essential component of clots.
 3. At the convergence of the intrinsic and extrinsic clotting cascades, coagulation factor Xa transforms prothrombin to thrombin.
 4. Enoxaparin limits the activity of factor Xa, and thus inhibits the generation of thrombin.
 5. Enoxaparin also limits the ability of thrombin to amplify the anticoagulation cascade.
- B. LMWHs have several advantages over un-fractionated heparins including:
1. Predictable anticoagulation dose response
 2. Improved subcutaneous bioavailability
 3. Dose-independent clearance and longer biologic half-life
 4. Lower incidence of thrombocytopenia
 5. Reduced need for routine laboratory monitoring
- C. Contraindications to use
1. Hypersensitivity to LMWH, pork products, methylparaben, or propylparaben
 2. History of Heparin Induced Thrombocytopenia (HIT), or suspected HIT
 3. Active bleeding
 4. hemophilia or other hemorrhagic tendencies
 5. Severe liver disease with elevated baseline Prothrombin Time (PT)
 6. Malignant hypertension
 7. Inability to meticulously supervise and monitor treatment
- D. Dosing Guidelines
1. Enoxaparin sodium is dosed subcutaneously in fixed (mg) or weight-based (mg/kg) doses.
 2. CSH order writers will follow the dosing regimen as established for a client by an outside consultant (the term "outside consultant" refers to a licensed physician who works outside of CSH and is experienced in anticoagulation therapy).
 3. FDA approved indications are provided in Table 1
 4. Renal impairment dosing
 - a Because the elimination half-life of LMWH is prolonged in renal impairment, dose adjustment may be necessary to avoid significant accumulation in these clients.
 - b Enoxaparin Sodium is dosed daily for clients with creatinine clearance less than 30 mL/min.
 - c Renal impairment dosing guidelines are provided in Table 1.
 5. Using Enoxaparin for short term anticoagulation when Warfarin is being initiated (when such use is indicated by an outside consultant).
 - a Since the anticoagulant effect of Warfarin is delayed, heparin is preferred initially for rapid anticoagulation.
 - b Conversion to Warfarin may begin concomitantly with heparin therapy or may be delayed 3 to 6 days.
 - c To ensure continuous anticoagulation, it is advisable to continue full dose heparin therapy, and to have Warfarin therapy overlap heparin for 4 to 5 days, until Warfarin has produced the desired therapeutic

response determined by the INR (International Normalized Ratio, see Warfarin section)

- d When Warfarin has produced the desired INR, heparin may be discontinued.
- e As heparin may affect the INR, clients receiving both heparin and Warfarin should have blood for INR determination drawn at least 24 hours after the last subcutaneous heparin injection.

E. Availability

- 1. The following injections of Enoxaparin Sodium are listed on the CSH Medication Formulary. All injections are 10mg per 0.1ml, and all syringes are marked in 0.1 ml increments:
 - a 30 mg in a total volume of 0.3 ml
 - b 60 mg in a total volume of 0.6 ml
 - c 80 mg in a total volume of 0.8 ml
 - d 100 mg in a total volume of 1 ml

F. CSH Order Writers :

- 1. Will write the name of the outside consultant when writing an order for Enoxaparin.
- 2. Will write the indication for use when writing an order for Enoxaparin.
- 3. May write an order to initiate the use of Enoxaparin, when recommended by an outside consultant.
 - a For this to happen, the outside consultant will submit a consultation form recommending the initiation of anticoagulant therapy. The form will list indications for use and desired therapeutic goals of Enoxaparin therapy.
 - b When writing such an initiation order, the Attending Physician will clearly state in writing on the order:
 - i. the approval of the Clinical Director for the initiation of therapy
 - ii. the outside consultant's indications for use and therapeutic targets/goals
 - iii. how medication therapy will be monitored by the Attending Physician
 - iv. how the client's safety (with regard to anticoagulant therapy) will be ensured by the Attending Physician.
- 4. May write an order to continue a dosing regimen of Enoxaparin, when recommended by an outside consultant
- 5. May write an order to adjust a dosing regimen of Enoxaparin only after discussing with the outside consultant who initiated the current regimen. When writing such an order, the Attending Physician will clearly state in writing on the order a synopsis of the consultation; and will also write full details of the consultation in the physician's progress notes. A copy of the progress note must accompany the order to the pharmacy.
- 6. May write an order to discontinue a dosing regimen of Enoxaparin with chart-documented advice of the outside consultant, OR in those cases where continuing presents clear and present danger to the client, provided that a) the order writer follows up as soon as possible with the outside

consultant who recommended Enoxaparin therapy, AND b) the conclusions of the follow up are clearly summarized in the physician's progress notes of the client's chart.

7. Concerning mg/kg dosing:

- a All orders will be written in terms of the mg dose to be administered. (I.E., orders will be written in the form of "administer X mg" and not in the form of "administer 1mg/kg"
- b Because Enoxaparin often needs to be dosed on a mg/kg basis, sometimes odd doses result (e.g. 62mg). Because the prefilled syringes are graduated in 0.1ml = 10 mg increments, when the order writer calculates odd doses, the order writer will order a rounded number of mg of Enoxaparin Sodium as per Table 2.

G. Laboratory Monitoring

1. LMWHs provide a predictable anticoagulant response when given subcutaneously. Therefore, routine laboratory monitoring is generally unnecessary to guide the dosing of these agents in otherwise healthy clients.
2. The Prothrombin Time (PT), the Activating Clotting Time (ACT), and the Partial Thromboplastin Time (PTT) are minimally affected by LMWHs.
3. Prior to initiation of LMWHs, a baseline INR, complete blood count (CBC) with platelet count, and serum creatinine should be obtained.
4. Most experts recommend monitoring the CBC every 5 to 10 days during the first 2 weeks of LMWH therapy and every 2 to 4 weeks thereafter.
5. Routine factor Xa activity is not necessary in a client whose condition is stable and uncomplicated.
6. Though there is very limited data to support the use of laboratory monitoring to guide LMWH therapy, measuring anti-factor Xa activity may be helpful in clients who have significant renal impairment (e.g., creatinine clearance of < 30 mL/min), weigh less than 50 kg, have morbid obesity (e.g., BMI \geq 40 kg/m² or weigh \geq 120 kg), or require prolonged therapy (e.g., > 14 days).
7. Periodic anti-factor Xa activity monitoring also may be useful in women treated with a LMWH during pregnancy because of changing pharmacokinetic variables.
8. Patients who are at very high risk of bleeding or thrombotic recurrence also may benefit from anti-factor Xa monitoring to avoid periods of over- or under-anticoagulation.
9. When anti-factor Xa therapy is used to monitor LMWH therapy, the sample should be drawn approximately 4 hours after the subcutaneous injection, during the peak period of anti-factor Xa activity.
10. A calibrated LMWH should be used to establish the standard curve for the assay.
11. The therapeutic range for anti-factor Xa activity is not well defined and to date has not been correlated clearly with efficacy or the risk of bleeding.
12. For the treatment of venous thromboembolism (VTE), an acceptable target range is 0.5 to 1.0 unit / mL.

13. Specific algorithms for dosing adjustments based on anti-factor Xa therapy are not available at the time of this writing.

H. Dispensing

1. CSH Pharmacy will fill acceptable order(s) in good faith that the CSH order writer is familiar with this policy, and is following this policy.
2. Whenever associated progress notes are required to be sent to Pharmacy, and no progress note is received by Pharmacy, Pharmacy will:
 - a Fill and dispense the medication as ordered; and
 - b Inform the Clinical Director that the progress note has not been received.

I. Administration

1. CSH Nursing will administer Enoxaparin according to current medication administration policy.

IV. Warfarin (Coumadin)

A. Description

1. Warfarin inhibits the hepatic synthesis of Vitamin K dependent clotting factors II (prothrombin), VII, IX, and X.
2. Therapeutic doses of Warfarin decrease the hepatic production of each active Vitamin K dependent clotting factor by 30% to 50%.
3. An anticoagulation effect generally occurs within 24 hours after drug administration. However, peak anticoagulant effect may be delayed 72 to 96 hours. The duration of action for a single dose of Warfarin is 2 to 5 days.
4. Reduced vitamin K is also required for the activation of endogenous anticoagulant proteins C and S. This creates a short term coagulant effect when Warfarin is initiated. Because of this, heparin is usually used at the beginning of Warfarin therapy.

B. Contraindications

1. Hypersensitivity to Warfarin
2. Pregnancy
3. Inability to meticulously supervise and monitor treatment
4. History of Warfarin – induced skin necrosis
5. Inability of client to obtain follow up PT/INR measurements when discharged.
6. Inappropriate medication use or lifestyle behaviors
7. Active bleeding
8. Hemophilia or other hemorrhagic tendencies
9. Severe liver disease with elevated baseline Prothrombin Time (PT)
10. Malignant hypertension
11. Recent or contemplated surgery of central nervous system, eye, or traumatic surgery involving large open surfaces
12. Bleeding tendencies associated with active ulceration or overt bleeding of:
 - a Gastrointestinal, genitourinary or respiratory tracts
 - b Cerebrovascular hemorrhage
 - c Aneurisms: cerebral, dissecting aortic

- d Pericarditis and pericardial effusions
 - e Bacterial endocarditis
- C. Dosing Guidelines
1. At CSH, Warfarin is dosed to attain a therapeutic INR target and goal range as recommended by an outside consultant (the term “outside consultant” refers to a licensed physician who works outside of CSH and is experienced in anticoagulation therapy).
 2. INR targets and INR Goal ranges for FDA approved indications are provided in Table 3.
- D. Availability
1. The following strengths of Warfarin tablets are listed on the CSH Medication Formulary.
 - a 1 mg
 - b 2 mg
 - c 2.5 mg
 - d 5 mg
- E. CSH Order Writers:
1. Will write the name of the outside consultant when writing an order for Warfarin.
 2. Will write the indication for use when writing an order for Warfarin.
 3. May write an order to initiate the use of Warfarin, when recommended by an outside consultant. For this to happen, the outside consultant will submit a consultation form recommending the initiation of Warfarin therapy. The form will list indication(s) for use and desired therapeutic goals of Warfarin therapy. When writing such initiation order(s), the Attending Physician will clearly state in writing on the order form:
 - a the approval of the Clinical Director for the initiation of therapy
 - b the outside consultant’s indications for use and therapeutic targets/goals
 - c how Warfarin therapy will be monitored by the Attending Physician
 - d how the client’s safety (with regard to Warfarin therapy) will be ensured by the Attending Physician.
 4. May write an order to continue a dosing regimen of Warfarin as previously established for a client by an outside consultant.
 5. May write an order to adjust a dosing regimen of Warfarin to meet the recommended target INR and goal range as indicated by the outside consultant. The reason(s) for the dose adjustment must be clearly stated in the written order, and in the progress notes of the clients chart. A copy of the progress note must accompany the order to the pharmacy.
 - a When adjusting the dose of Warfarin, the clinician will allow sufficient time for changes in the INR to occur.
 - b In general, dose adjustments should not be made more frequently than every 3 days.
 - c Doses should be adjusted by calculating the weekly dose and reducing or increasing the weekly dose by 5% to 25%.

- d The effect of a small dose change may not become evident for 5 to 7 days; therefore, clients should not have follow-up PT tests obtained prior to that time.
6. An order writer may write to discontinue a dosing regimen of Warfarin:
- a With chart-documented advice of the original (outside CSH) order writer/ consultant OR
 - b In those cases where continuing presents clear and present danger to the client, provided that the order writer follows up as soon as possible with the outside order writer who initiated Warfarin therapy, and the conclusion(s) of the follow up are clearly summarized in the client's chart.
7. Concerning Warfarin treatment during Dentistry and Surgery (Though any such dose adjustments to Warfarin will be determined by outside consultant, the following information is provided for reference).
- a The management of clients on anticoagulant therapy who are to undergo dental and surgical procedures requires close liaison between Attending Physicians, surgeons, and dentists.
 - b INR determination is recommended just prior to any dental or surgical procedure.
 - c In clients undergoing minimally invasive procedures who must be anticoagulated prior to, during, or immediately following these procedures, adjusting the dosage of Warfarin to maintain the INR at the low end of the therapeutic range may safely allow for continued anticoagulation.
 - d The operative site should be sufficiently limited and accessible to permit the effective use of local procedures for hemostasis. Under these conditions, dental and minor surgical procedures may be performed without undue risk of hemorrhage.
 - e Some dental or surgical procedures may necessitate the interruption of Warfarin therapy.
 - f When discontinuing Warfarin even for a short period of time, the benefits and risks should be strongly considered.
- F. Therapeutic Monitoring of Warfarin
- 1. Prothrombin time (PT) is a measure of the biologic activity of factors II, VII, and IX. Though PT time correlates well with Warfarin's effect, it is problematic to interpret because there is wide variation in the sensitivity of various thromboplastin reagents.
 - 2. The International Normalized Ratio (INR) corrects for differences in thromboplastin reagents.
 - 3. A baseline INR and CBC (complete blood count) should be obtained prior to initiating Warfarin therapy.
 - 4. In a patient with an acute thromboembolic event, INR should be measured minimally every 3 days during the first week of therapy. (In these situations, the client should continue to receive LMWH for 5 days and until the INR is greater than 2.0).

5. The concurrent use of anti-thrombotic drugs with Warfarin may prolong the INR slightly.
 6. Once the patient's dose-response is established, an INR should be determined every 7 to 14 days until it stabilizes and optimally every 4 weeks thereafter.
 7. See Table 3 for recommended target INR and goal range based on therapeutic indication.
 8. Laboratory Responsibilities
 - a All INR measurements will be automatically sent to the Attending Physician and the Pharmacy upon availability from the laboratory.
 9. Physician Responsibilities
 - a The Attending Physician is responsible for ordering, monitoring, and documenting all relevant lab work (e.g. INR) for each assigned client who is receiving Warfarin therapy.
 - b All monitoring data must be documented in the physician's progress notes.
 - c Using the above information, the Attending Physician is responsible for adjusting doses as necessary to meet the therapeutic INR target/range.
 10. Pharmacy Responsibilities
 - a Pharmacy is responsible for monitoring Physician adjustments to Warfarin therapy , and for notifying the Clinical Director and Attending Physician, whenever pharmacy observes data suggesting that a client is at risk of unnecessary bleeding, as described below:
 - b For those areas having a Clinical Pharmacist assigned to review charts (currently DDS and Craig):
 - i. The Clinical Pharmacist will monitor INR and Warfarin dosing according to the following schedule:
 - DDS: at least every 90 days.
 - Craig: at least every month.
 - ii. Whenever the Clinical Pharmacist observes data suggesting that a client is prone to unnecessary bleeding risk, that pharmacist will:
 - Immediately notify the Attending Physician and the Clinical Director.
 - Summarize concerns and any suggestions for dose changes in the client's chart.
 - c For Central Pharmacy:
 - i. Pharmacy will monitor INR data as received in Central Pharmacy.
 - ii. Whenever a Pharmacist observes an INR of 3.5 or greater, that Pharmacist will immediately notify the Attending Physician and the Clinical Director.
- G. Adverse Effects
1. Warfarin's primary adverse effect is bleeding.
 2. The gastrointestinal tract is the most common site of bleeding.
 3. Intracranial hemorrhage is the most serious and feared complication.
 4. The risk of intracranial hemorrhage increases significantly when the INR remains greater than 4.0 for prolonged periods of time.

5. Clients whose INR is greater than 3.0 have twice the incidence of major bleeding compared with those with a goal range of 2.0-3.0.
 6. Patients given low intensity Warfarin therapy (goal INR 1.3 – 1.9) have a level of anticoagulation that is insufficient protection against thrombosis for most indications.
- H. Management of Bleeding and Excessive Anticoagulation
1. When a client has signs or symptoms of bleeding and rapid reversal of excessive anticoagulant is required:
 - a Immediately transfer the client to an acute care hospital for treatment.
 2. When a client reveals no signs or symptoms of bleeding and rapid reversal of excessive anticoagulant is not required.
 - a INR above therapeutic range but < 5.0
 - i. Examine client for signs and symptoms of bleeding, as well as for factors that increase bleeding risk.
 - ii. Consider omitting the next dose of Warfarin.
 - iii. Check INR in 3-7 days
 - iv. Restart Warfarin at a reduced dose.
 - b INR > 5.0
 - i. Transfer client to an acute care hospital for treatment
- I. Interactions
1. Drug-Drug Interactions (see Table 4)
 2. Drug-Herbal Interactions (see Table 5)
 3. Drug- Food Interactions (Vitamin K) (see Table 6)
- J. Monitoring of Diet
1. The goal of dietary monitoring is to establish and maintain a steady average intake of vitamin K, while avoiding significant fluctuations in vitamin K intake.
 2. The Dietary Department will at any time be able to print a list of all CSH clients currently receiving Warfarin.
 3. At least monthly, the Dietary Department will review a list of CSH clients currently receiving Warfarin, and will ensure that these clients are receiving and will continue to receive a diet that provides a relatively steady intake of Vitamin K, to minimize variability in Vitamin K intake.
 4. See Table 6 for an example of Vitamin K content of select foods.
- K. Dispensing
1. CSH Pharmacy will fill acceptable order(s) received from a CSH order writer in good faith that the order writer is familiar with and is following this policy.
 2. Whenever associated progress notes are required to be sent to Pharmacy, and no progress note is received by Pharmacy, Pharmacy will:
 - a Fill and dispense the medication as ordered
 - b Inform the Clinical Director that no progress note has been received.
- L. Administration
1. CSH Nursing will administer Warfarin according to current medication administration policy.

Table 1: FDA Approved Indications and Dosing of Enoxaparin Sodium.

Indication	Dose as Enoxaparin Sodium	Renal Impairment (CrCl < 30ml /min)
<u>DVT prophylaxis</u> for those at risk of thromboembolic complications who are undergoing abdominal surgery	40 mg SC once per day, initiated 2 hrs before surgery, and continued for a total of 7-10 days (up to 12 days administration has been administered in clinical trials).	30 mg SC once daily
<u>DVT prophylaxis</u> hip or knee replacement surgery.	30 mg SC every 12 hours, initiated 12-24 hours after surgery (provided hemostasis is established) and continued for a total of 7 to 10 days. (up to 14 days administration has been administered in clinical trials)	30 mg SC once daily
<u>DVT prophylaxis</u> (alternative) for a client who is undergoing hip replacement surgery.	40mg SC once per day, initiated 12 hr prior to surgery and continued for a total of 7 to 10 days. (up to 14 days administration has been administered in clinical trials)	30 mg SC once daily
<u>DVT prophylaxis</u> in a client who is at risk of thromboembolic complications due to restricted mobility during acute illness	40 mg SC once a day for 6-7 days(up to 14 days has been administered in clinical trials)	30mg SC once daily
<u>Continued DVT prophylaxis</u> following initial stage of thrombophylaxis in hip replacement surgery	40mg SC once a day for 3 weeks	30mg SC once daily
<u>DVT Treatment</u> with or without pulmonary embolism for a hospitalized client	1 mg/kg SC every 12 hours; or 1.5mg/kg SC once a day administered at the same time every day. Warfarin therapy should be initiated when appropriate (usually within 72 hours of initiating Enoxaparin Sodium). Enoxaparin Sodium should be continued until a therapeutic oral anticoagulant effect has been achieved (INR of 2.0 – 3.0). The average duration of administration is 7 days; up to 17 days has been administered in clinical trials.	1mg/kg SC once daily
Unstable angina or non-Q-wave myocardial infarction	1mg/kg administered SC every 12 hours in conjunction with oral aspirin therapy (100-325mg per day).Treatment should last a minimum of 2 days and should be continued until clinical stabilization. Usual duration is 2 to 8 days; up to 12.5 days has been administered in clinical trials.	1mg/kg SC once daily
Acute ST-segment myocardial infarction*	< 75 years old: Single IV bolus of 30mg plus a 1mg/kg SC dose followed by 1mg/kg administered SC every 12 hours(Maximum 100mg for the first two doses combined, followed by 1mg/kg dosing for the remaining	< 75 years old: 30 mg single IV bolus plus 1mg/kg SC dose followed by 1mg/kg SC administered once daily

	doses). ≥ 75 years old: no initial IV bolus: initiate dosing with 0.75mg/kg SC every 12 hours (maximum 75mg for the first two doses only, followed by 0.75mg/kg for the remaining doses).	≥75 years old: 1mg/kg SC once daily (no bolus dose)
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*When administered in conjunction with a thrombolytic (fibrin-specific or non-fibrin specific). Lovenox should be given between 15 minutes before and 30 minutes after the start of fibrinolytic therapy. All patients should receive acetylsalicylic acid (ASA) as soon as they are identified as having STEMI and maintained with 75 to 325mg once daily unless contraindicated. In the pivotal clinical study, the Lovenox treatment duration was 8 days or until hospital discharge, whichever came first. An optimal treatment is not known, but is likely to be longer than 8 days.

Table 2: Rounded doses for mg/kg Enoxaparin Sodium dosing

When the calculated dose falls into this range	The order will read
30 – 34 mg	30 mg
35 – 44 mg	40 mg
45 – 54 mg	50 mg
55 – 64 mg	60 mg
65 – 74 mg	70 mg
75 – 84 mg	80 mg
85 – 94 mg	90 mg
95 -104 mg	100 mg
105 – 114 mg	110 mg
115 – 124 mg	120 mg
125 -134 mg	130 mg
135 – 144 mg	140 mg
145 – 154 mg	150 mg
155 – 164 mg	160 mg
165 – 174 mg	170 mg
175 – 184 mg	180 mg

Table 3: Therapeutic Indications for Warfarin and Corresponding INR Target and Goal Ranges

Indication	Target INR	Goal Range
Atrial fibrillation Acute myocardial infarction Venous thrombosis (DVT) Pulmonary embolism Peripheral vascular disease Hypercoagulable state Bioprosthetic heart valves St Jude Medical Bileaflet mechanical valve in aortic position	2.5	2.0-3.0
Caged ball heart valve Caged disk heart valve	3.0	2.5 – 3.5

Table 4: Clinically Important Warfarin Drug-Drug Interactions

Increased Anticoagulation (Increased INR)	Decreased Anticoagulation (Decreased INR)	Increased Bleeding Risk
Acetaminophen (Tylenol) Alcohol binge Allopurinol Amiodarone Agatrobam Cephalosporins with MTP side chain Chloral Hydrate Chloramphenicol Cimetidine Ciprofloxacin Clofibrate Danazol Disulfiram Doxycycline Erythromycin Fenofibrate Fluconazole Fluorouracil Fluoxetine Fluvoxamine Gemfibrozil Influenza vaccine Isoniazid Itraconazole Lovastatin Metronidazole Miconazole Moxalactam Neomycin Norfloxacin Ofloxacin Omeparazole Phenylbutazone Piroxicam Propafenone Propoxyphene Quinidine Sertraline Sulfamethoxazole Sulfinpyrazone Tamoxifen Testosterone Vitamin D Zafirlukast	Amobarbital Butabarbital Carbamazepine Cholestyramine Dicloxacillin Griseofulvin Nafcillin Phenobarbital Phenytoin Primidone Rifabutin Rifampin Secobarbital Sucralfate Vitamin K	Aspirin Clopidogrel Danaparoid Dipyridamole NSAIDS Ticlopidine UFH LMWH

Table 5: Clinically Important Warfarin Drug-Herbal/Nutrient Interactions

Increased Anticoagulation (Increased Bleeding Risk or INR)	Decreased Anticoagulation (Decreased INR)
Angelica root Amica flower Anise Asafoetida Bogbean Borage seed oil Bromelain Capsicum Celery Chamomile Clove Danshen Devil's claw Dong quai Fenugreek Feverfew Garlic Ginger Ginko Horse chestnut Licorice root Lovage root Meadowsweet Onion Parsley Papain Passionflower herb Polar Quassia Red clover Rue Sweet clover Turmeric Willow bark Vitamin E	Ginseng Green tea St John's Wort Coenzyme Q ₁₀

Table 6 Vitamin K Content of Select Foods

Low (< 50 mcg)	Medium (50-100 mcg)	High (100-200 mcg)	Very High (>200 mcg)
Apple, red Avocado Beans Breads, grains Carrot Celery Cereal Coffee Corn Cucumber (w/o peel) Dairy products Eggs Fruit (varies) Lettuce, iceberg Meats, fish , poultry Pasta Peanuts Peas Potato Rice Tomato	Apple, green Asparagus Cabbage Cauliflower Mayonnaise Nuts, pistachio Squash, summer	Basil Broccoli Canola oil Chive Coleslaw Cucumber (w/peel) Green onion/scallion Lettuce, butterhead Mustard greens Soybean oil	Brussles sprouts Chick pea Collard greens Coriander Endive Kale Lettuce, red leaf Parsley Spinach Swiss chard Tea, black Tea, green Turnip greens Watercress

Approved:

This plan has been approved by the RHA and CMO on 10/26/10.