Optima Health

Oral Anticoagulation Guideline

Guideline History

Date Approved	09/99,02/02,01/04,01/06, 03/08
Date Revised	11/00, 12/05, 01/08
Date Reviewed	12/05, 12/07
Next Review Date	03/08

Oral Anticoagulation Guideline

Existing evidence suggests that coordinated anticoagulation therapy utilizing patient assessment and management guidelines is most likely to achieve desirable clinical outcomes. Numerous studies demonstrate that careful monitoring of oral anticoagulation therapy through a coordinated approach precludes morbidity and mortality and improves patient outcomes.

This guideline is designed to assist the Ambulatory Care Physician or other healthcare provider (under direct physician supervision) in the management of patients on oral anticoagulation therapy.

Initiation of Oral Anticoagulation

1. ***Warfarin tablet strength:*** It is recommended that warfarin therapy be initiated with a 2-mg tablet for ease of dosage titration. Once the patient's dosage has stabilized, alternative tablet strengths can be utilized on an individualized basis.
2. ***Warfarin initial dosage:*** Warfarin dosage should be initiated based on the patient's age as warfarin requirements generally decline with advancing age *(see Figure 2 or Figure 3).*

Patient Assessment and Management *(see Figure 1)*

1. INR determination (in office or send out)
2. Repeat procedure if lab/machine error suspected
3. At the time of INR evaluation, the patient should be assessed (via office visit, telephone) for:
   a. indication and recommended therapeutic range for anticoagulation *(see Table 1)*
   b. verification of current warfarin dose
   c. evaluation of current medication profile (Rx, OTC, herbal)
   d. compliance with anticoagulation regimen
   e. recent acute illnesses (can alter INR results)
   f. changes in diet (especially foods rich in vitamin-K or decreased oral intake, *see Table 2*)
   g. alcohol use
   h. assessment of educational needs
4. Evaluate medication profile for potential drug-drug and drug-herb interactions with warfarin *(see Table 3 and Table 4).*
5. Evaluate other factors that may affect the INR *(see Table 5).*
6. Assess patient for signs and symptoms of thromboembolism
   a. weakness, numbness, tingling
   b. blurred vision
   c. slurred speech
   d. dizziness
   e. leg pain / swelling
   f. dyspnea / chest pain
7. Assess patient for signs and symptoms of bleeding*
   a. spontaneous bruising
   b. bleeding gums
   c. epistaxis
   d. hematuria
   e. petechiae / ecchymosis
   f. hematemesis
   g. melena / hematochezia
   h. hemoptysis
   i. other bleeding
8. Evaluate the duration of oral anticoagulation *(see Table 6).*
9. Adjust regimen based on management algorithms *(see Figure 2 and Figure 3).*
   For management of patients with high INR values, *(see Table 7).*
   Provide appropriate education *(see Coumadin Patient Information* handout).
10. Schedule follow-up based on management algorithms (see Figure 2 or Figure 3).

*Minor bleeding defined as self-limiting and not requiring medical care for resolution. Moderate or major bleeding defined as requiring medical care or hospitalization (i.e., urgent care, and emergency room).

Oral Anticoagulation Algorithm

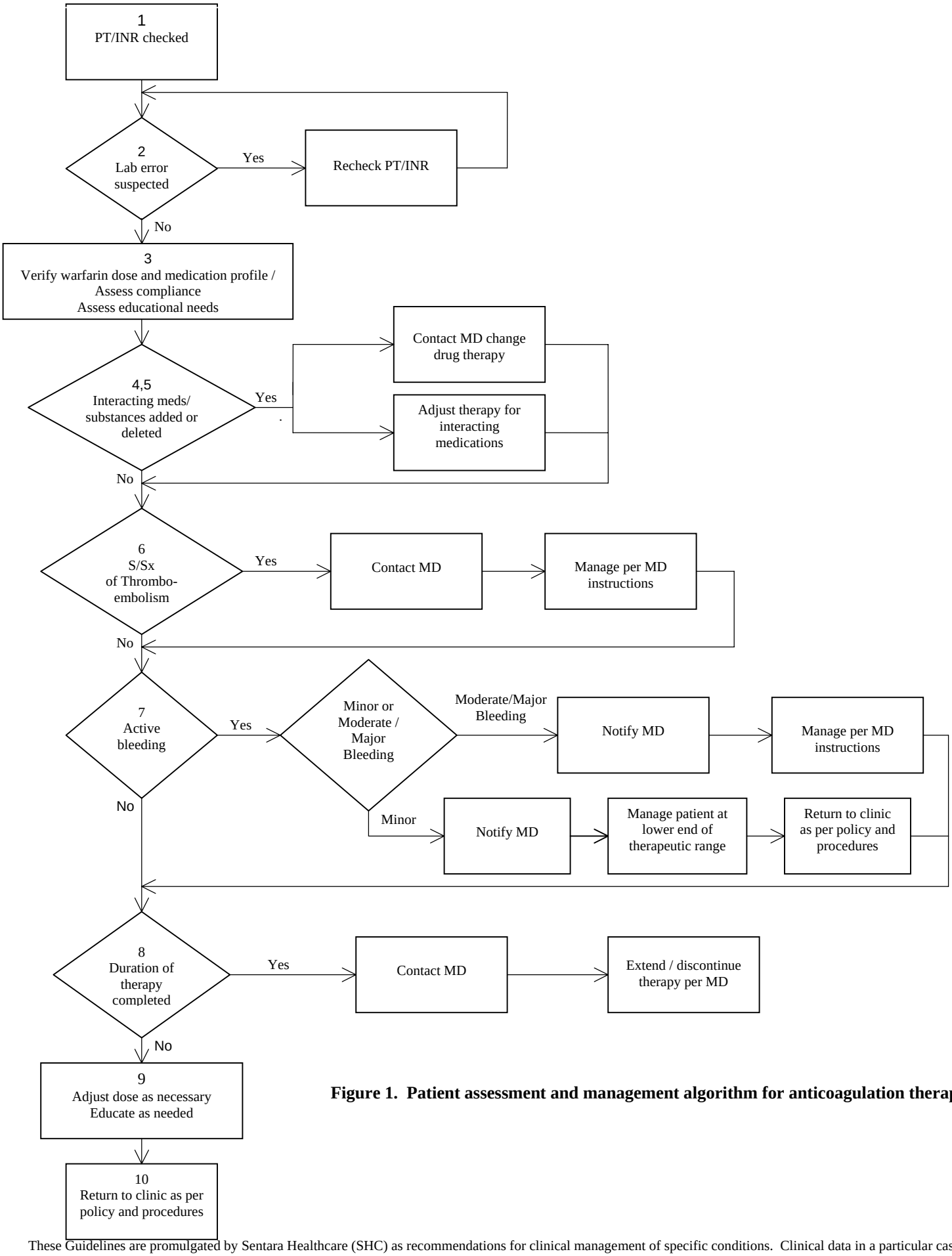

Figure 1. Patient assessment and management algorithm for anticoagulation therapy.

These Guidelines are promulgated by Sentara Healthcare (SHC) as recommendations for clinical management of specific conditions. Clinical data in a particular case may necessitate or permit deviation from these Guidelines. The SHC Guidelines are institutionally endorsed recommendations and are not intended as a substitute for clinical judgment.

Target INR 2.5 (range, 2.0 – 3.0)

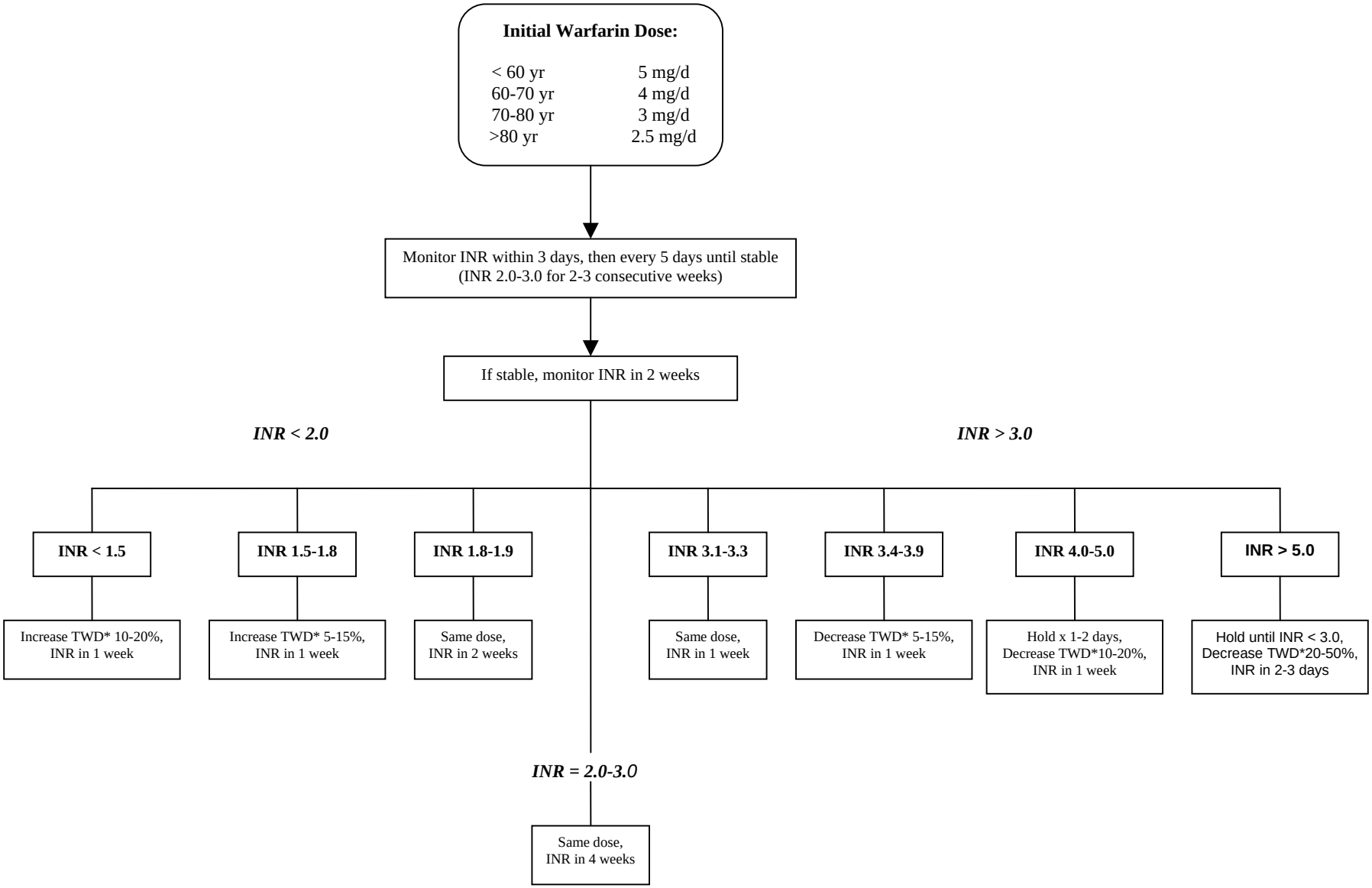

Figure 2. Dosage adjustment and laboratory assessment algorithm for the therapeutic INR goal of 2.5 (range, 2.0-3.0).

* TWD = Total Weekly Dose

Target INR 3.0 (range, 2.5 – 3.5)

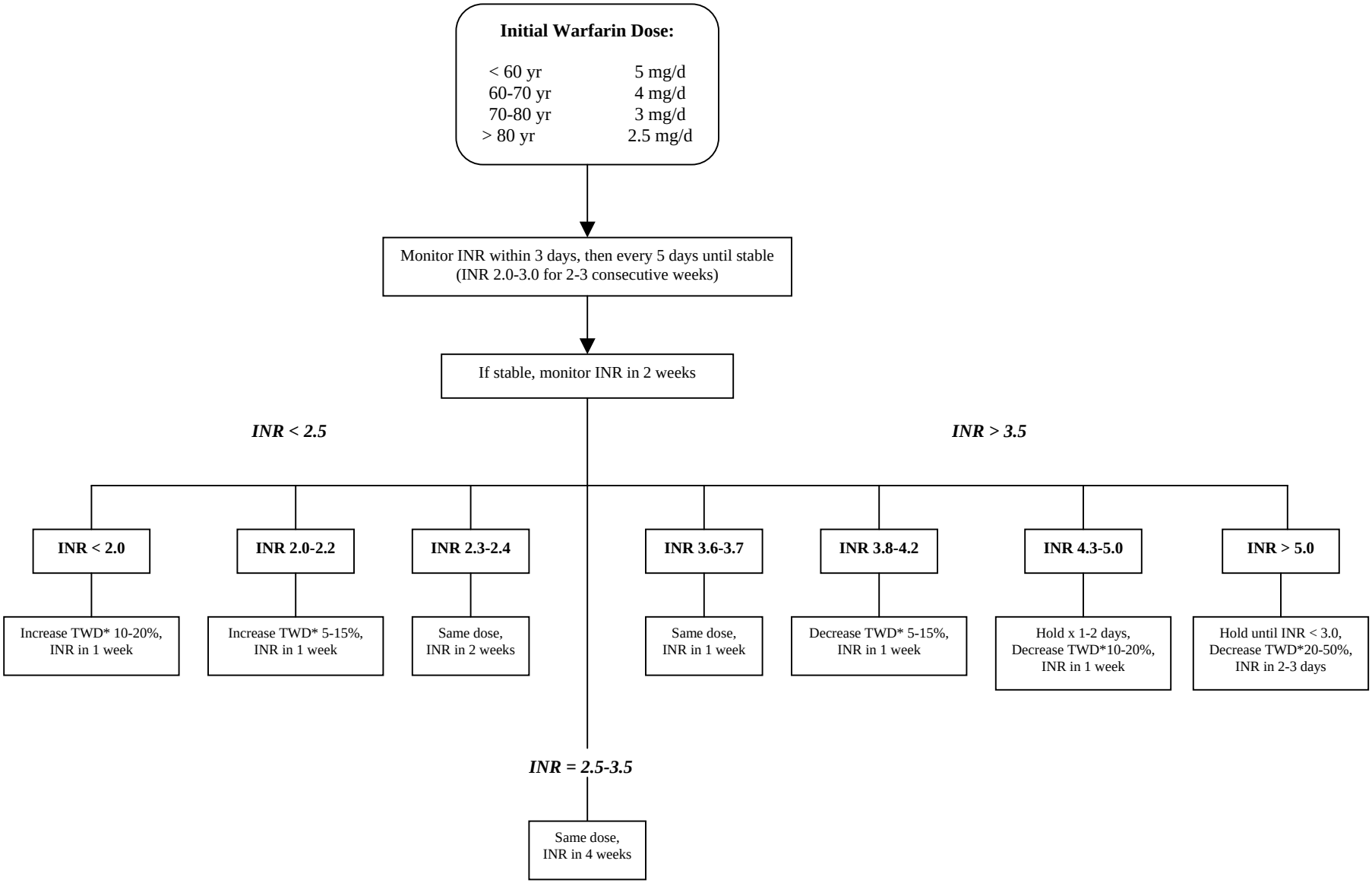

Figure 3. Dosage adjustment and laboratory assessment algorithm for the therapeutic INR goal of 2.5 (range, 2.0-3.0).

* TWD = Total Weekly Dose

Table 1. Indications and Recommended Therapeutic Range For Oral Anticoagulation Therapy

INDICATION	INR
Prophylaxis of venous thrombosis (high risk surgery) Treatment of venous thrombosis Treatment of pulmonary embolism Prevention of systemic embolism Tissue heart valves AMI (to prevent systemic embolism) Valvular heart disease Atrial fibrillation *(see Table 1A)*	Goal 2.5 (range: 2.0 to 3.0)
Mechanical prosthetic valves (high risk) Certain patients with thrombosis and the antiphospholipid syndrome AMI (to prevent recurrent AMI)	Goal 3.0 (range: 2.5 to 3.5)
Bileaflet mechanical valve in the aortic position, NSR	Goal 2.5 (range: 2.0 to 3.0)

Table 1a. Recommendations For Patients With Atrial Fibrillation Considered For Chronic Oral Anticoagulation Therapy

AGE	MAJOR RISK FACTORS*	*RECOMMENDATION*
< 65	No	Aspirin
< 65	Yes	Warfarin†
65 to 75	No	Aspirin or warfarin†
65 to 75	Yes	Warfarin†
> 75	All patients	Warfarin†

*Previous TIA, stroke, or systemic embolism; poor left ventricular function (moderate to severe left ventricular dysfunction on echocardiography, or recent CHF); hypertension.

†Goal INR 2.5; range 2.0 to 3.0

Table 2. Vitamin K_1 content of selected foods

SELECTED FOODS	HIGH	MED	LOW
Abalone			•
Algae, hijiki	•		
Apple, green peel only		•	
Apple, red peel only			•
Artichoke			•
Asparagus, raw		•	
Avocado, peeled		•	
Beans, dried			•
Beans, green		•	
Broccoli	•		
Brussel sprouts	•		
Butter			•
Cabbage, raw		•	
Canola oil		•	
Cauliflower			•
Celery			•
Cereals or breads			•
Chayote	•		
Coffee			•
Coleslaw		•	
Cucumbers	•		
Dairy products			•
Eggs			•
Endive	•		
Fish			•
Flour			•
Fruit			•
Fruit juices			•

SELECTED FOODS	HIGH	MED	LOW
Green peppers			•
Kale	•		
Lettuce	•		
Margarine		•	
Mayonnaise	•		
Meat			•
Mint	•		
Mustard greens	•		
Olive oil		•	
Onion, green, raw	•		
Onion, white raw			•
Parsley	•		
Peanut butter			•
Peas or pea pods		•	
Pistachio nuts		•	
Rice or pasta			•
Root vegetables			•
Salad oil	•		
Soybean oil	•		
Soybeans		•	
Spinach	•		
Squash		•	
Swiss chard	•		
Tea, green, leaves, dry	•		
Tomato			•
Turnip greens	•		
Watercress	•		

Table 3. Drug Interaction Considerations With Warfarin

Specific Drugs Reported	↑ PT/INR	↓ PT/INR
Acetaminophen	•	
Alcohol	•	•
Allopurinol	•	
Aminoglutethimide		•
Aminosalicylic acid	•	
Amiodarone	•	
Amobarbital		•
Aspirin	•	
Azathioprine		•
Azithromycin	•	
Butabarbital		•
Butalbital		•
Carbamazepine		•
Cefamandole	•	
Cefazolin	•	
Cefoperazone	•	
Cefotetan	•	
Cefoxitin	•	
Ceftriaxone	•	
Celecoxib	•	
Chenodiol	•	
Chloral hydrate*	•	•
Chloramphenicol	•	
Chlordiazepoxide		•
Chlorpropamide	•	
Chlorthalidone		•
Cholestyramine*	•	•
Cimetidine	•	
Ciprofloxacin	•	
Clarithromycin	•	
Clofibrate	•	
Corticotropin		•
Cortisone		•
Cyclophosphamide*	•	•
Danazol	•	
Dextran	•	
Dextrothyroxine	•	
Diazoxide	•	
Diclofenac	•	
Dicloxacillin		•
Disulfiram	•	
Doxycycline	•	
Ethacrynic acid	•	
Ethchlorvynol		•
Fenoprofen	•	
Fluconazole	•	
Fluorouracil	•	
Fluoxetine	•	
Fluvoxamine	•	
Glucagon	•	
Glutethimide		•
Griseofulvin		•
Haloperidol		•
Halothane	•	
Heparin	•	
Ibuprofen	•	
Ifosfamide	•	
Indomethacin	•	
Influenza virus vaccine	•	
Itraconazole	•	
Ketoprofen	•	
Ketorolac	•	
Levamisole	•	
Levothyroxine	•	
Liothyronine	•	
Lovastatin	•	
Mefenamic acid	•	
Meprobamate		•
6-Mercaptopurine		•
Methimazole*	•	•
Methyldopa	•	
Methylphenidate	•	
Methylsalicylate oint, topical	•	
Metronidazole	•	
Miconazole	•	
Moricizine*	•	•
Nafcillin		•
Naproxen	•	
Neomycin	•	

*Both increased and decreased PT/INR responses have been reported.

Because a patient may be exposed to a combination of the above factors, the net effect of warfarin on PT/INR response may be unpredictable. More frequent PT/INR monitoring is therefore advisable. Medications of unknown interaction with warfarin are best regarded with caution. When these medications are started or stoppped, more frequent PT/INR monitoring is advisable.

Table 3. Drug Interaction Considerations with Warfarin (cont'd)

Specific Drugs Reported	↑ PT/INR	↓ PT/INR
Ofloxacin	•	
Olsalazine	•	
Omeprazole	•	
Oxaprozin	•	
Oxymetholone	•	
Paraldehyde		•
Paroxetine	•	
Penicillin G, intravenous	•	
Pentobarbital		•
Pentoxifylline	•	
Phenobarbital		•
Phenylbutazone	•	
Phenytoin*	•	•
Piperacillin	•	
Piroxicam	•	
Prednisone*	•	•
Primidone		•
Propafenone	•	
Propoxyphene	•	
Propranolol	•	
Propylthiouracil*	•	•
Quinidine	•	
Quinine	•	
Ranitidine*	•	•
Rifampin		•
Sertraline	•	

Specific Drugs Reported	↑ PT/INR	↓ PT/INR
Sertraline	•	
Stanozolol	•	
Streptokinase	•	
Sucralfate		•
Sulfamethizole	•	
Sulfamethoxazole	•	
Sulfinpyrazone	•	
Sulfisoxazole	•	
Sulindac	•	
Tamoxifen	•	
Tetracycline	•	
Thyroid	•	
Ticarcillin	•	
Ticlopidine	•	
Tissue plasminogen activator (t-PA)	•	
Tolbutamide	•	
Trazodone		•
Trimethoprim / sulfamethoxazole	•	
Urokinase	•	
Valproate	•	
Vitamin C, high dose		•
Vitamin E	•	
Vitamin K		•

*Both increased and decreased PT/INR responses have been reported.

Because a patient may be exposed to a combination of the above factors, the net effect of warfarin on PT/INR response may be unpredictable. More frequent PT/INR monitoring is therefore advisable. Medications of unknown interaction with warfarin are best regarded with caution. When these medications are started or stopped, more frequent PT/INR monitoring is advisable.

Table 4. Herbal Interaction Considerations with Warfarin

Botanicals that contain coumarins with potential anticoagulant effects:		
Agrimony	Celery	Parsley
Alfalfa	Chamomile	Passion Flower
Angelica (Dong Quai)	(German and Roman)	Prickly Ash (Northern)
Aniseed	Dandelion	Quassia
Arnica	Fenugreek	Red Clover
Asafoetida	Horse Chestnut	Sweet Clover
Bogbean	Horseradish	Sweet Woodruff
Boldo	Licorice	Tonka Beans
Buchu	Meadowsweet	Wild Carrot
Capsicum	Nettle	Wild Lettuce
Cassia		

Miscellaneous botanicals with anticoagulant properties:		
Bladder Wrack *(Fucus)*	Pau d'arco	

Botanicals that contain salicylate and/or have antiplatelet properties:		
Agrimony	Dandelion	Meadowsweet
Aloe Gel	Feverfew	Onion
Aspen	Garlic	Policosanol
Black Cohosh	German Sarsaparilla	Poplar
Black Haw	Ginger	Senega
Bogbean	Ginkgo Biloba	Tamarind
Cassia	Ginseng *(Panax)*	Willow
Clove	Licorice	Wintergreen

Botanicals with fibrinolytic properties:		
Bromelains	Garlic	Inositol Nicotinate
Capsicum	Ginseng *(Panax)*	Onion

Botanicals with coagulant properties:		
Agrimony	Mistletoe	
Goldenseal	Yarrow	

Source: Bristol-Myers Squibb Company (2007). Anticoagulant: Coumadin®. Retreived 01/08/2008, from http://www.fda.gov/cder/foi/label/2007/009218s105lblv2.pdf

Table 5. Other Factors That May Affect PT/INR

SPECIFIC FACTORS REPORTED	↑ PT/INR	↓ PT/INR
Blood dyscrasias	•	
Cancer	•	
Collagen vascular disease	•	
Congestive heart failure	•	
Diarrhea	•	
Diet high in vitamin K		•
Dietary deficiencies	•	
Edema		•
Elevated temperature	•	
Hepatic disorders (infectious hepatitis, jaundice)	•	
Hereditary coumarin resistance		•
Hyperlipemia		•
Hyperthyroidism	•	
Hypothyroidism		•
Nephrotic syndrome		•
Poor nutritional state	•	
Prolonged hot weather	•	
Steatorrhea	•	
Vitamin K deficiency	•	

Table 6. Duration Of Oral Anticoagulation Therapy*

PATIENT CHARACTERISTICS	LENGTH OF TREATMENT
Most patients	Heparin or LMWH and warfarin can be started together; heparin or LMWH can be discontinued on day 5 or 6, if the INR has been in therapeutic range for 2 consecutive days; continue warfarin for 3 to 6 months
Massive PE or severe iliofemoral thrombosis	Consider a longer period of heparin therapy
Reversible or time-limited risk factors† and a first event	Treat 3 to 6 months
Heterozygous APC resistance and a first event	Treat 3 to 6 months
First episode of idiopathic DVT	Treat at least 6 months
Recurrent venous thrombosis, or first event with a continuing risk factor (cancer, inhibitor deficiency states, antiphospholipid antibody syndrome)	Treat indefinitely
APC resistance (Factor V Leiden)	Probably treat indefinitely, if patients have recurrent disease, are homozygous for the gene, or have multiple thrombophilic conditions
Patients with symptomatic isolated calf vein thrombosis	Treat with anticoagulants for at least 3 months; if anticoagulation cannot be given , perform serial noninvasive studies of the lower extremity to assess for proximal extension of thrombus over the next 7 to 14 days

*Subject to modification according to patient's age, comorbidity factors, likelihood of recurrence.

†Transient immobilization, trauma, surgical procedure, estrogen use.

APC = activated protein C.

Table 7. Managing Patients With High INR Values

CLINICAL SITUATION	GUIDELINES
INR > therapeutic range but < 5.0 (no clinically significant bleeding, rapid reversal not indicated for reasons of surgical intervention)	Lower the dose or omit the next dose; resume warfarin therapy at a lower dose when the INR approaches desired range If the INR is only minimally above therapeutic range, dose reduction may not be necessary
INR > 5.0 but < 9.0 (no clinically significant bleeding)	Patients with no additional risk factors for bleeding: omit the next dose or two of warfarin, monitor INR more frequently, and resume warfarin therapy at a lower dose when the INR is in the therapeutic range Patients at increased risk of bleeding: omit the next dose of warfarin, and give vitamin K_1 (1.0 to 2.5 mg orally) Patients requiring more rapid reversal before urgent surgery or dental extraction: vitamin K_1 (2 to 4 mg orally); if the INR remains high at 24 hr: an additional dose of 1 to 2 mg
INR > 9.0 (no clinically significant bleeding) (Serious bleeding, or warfarin overdose (*eg*, INR > 20) requiring very rapid reversal of anticoagulant effect)	Vitamin K_1 (3 to 5 mg orally); closely monitor the INR; if the INR is not substantially reduced by 24 to 48 h, the vitamin K_1 dose can be repeated Vitamin K_1 (10 mg by slow IV infusion), with fresh plasma transfusion or prothrombin complex concentrate, depending on urgency; vitamin K_1 injections may be needed q12h
Life-threatening bleeding or serious warfarin overdose	Prothrombin complex concentrate, with vitamin K_1 (10 mg by slow IV infusion); repeat if necessary depending upon the INR
Continuing warfarin therapy indicated after high doses of vitamin K_1	Heparin, until the effects of vitamin K_1 have been reversed, and patient is responsive to warfarin

Coumadin® Patient Information

Your physician has prescribed a medication called ***Coumadin®*** (also known as warfarin sodium). The following information should help you to understand what Coumadin® is and how it works.

COUMADIN® AND HOW IT WORKS

Coumadin® is an ***anticoagulant***. The purpose of this medication is to prevent harmful blood clots from forming or growing. The medication works by decreasing the amount of active clotting factors in the bloodstream. By decreasing these clotting factors, harmful clots are less likely to form. Coumadin® is used in patients who have developed clots in their lungs, heart or legs, patients with artificial heart valves, atrial fibrillation, or have suffered a heart attack. It may be used in other patients who the doctor feels may be at increased risk for developing a clot (patients who have undergone recent surgery, patients who will be on prolonged bedrest, etc.)

HOW COUMADIN® SHOULD BE TAKEN

• **Take COUMADIN exactly as prescribed by your physician.** Your healthcare provider will adjust your dose from time to time depending on your response to COUMADIN.

• **You must have regular blood tests and visits with your healthcare provider to monitor your condition.**

• **Take COUMADIN at the same time every day.** You can take COUMADIN either with food or on an empty stomach.

• **If you miss a dose of COUMADIN, call your healthcare provider.** Take the dose as soon as possible on the same day. Do not take a double dose of COUMADIN the next day to make up for a missed dose. Missing only one dose will not make a clot form. Taking more than prescribed dose can cause bleeding. The dose required to keep a clot from forming is often very close to the dose that may cause bleeding.

• **Call your healthcare provider right away if you take too much COUMADIN.**

• **Call your healthcare provider if you are sick with diarrhea, an infection, or have a fever.**

• **Tell your healthcare provider about any planned surgeries, medical or dental procedures.** Your COUMADIN may have to be stopped for a short time or you may need your dose adjusted.

• **Call your healthcare provider right away if you fall or injure yourself, especially if you hit your head.** Your healthcare provider may need to check you.

DETERMINING THE DOSE OF COUMADIN®

While you are taking this medication, your doctor or staff at the Anticoagulation Service will monitor a blood test called the ***INR*** (International Normalized Ratio), which used to be called the ***prothrombin time*** *(also known as the PT or protime).* This blood test is needed to make sure you are taking the right amount of medication.

SIGNS OF ADVERSE EFFECTS

Since one of the signs of too much medication is bleeding, you should be aware of the signs and symptoms of bleeding. If you notice any of the following signs and symptoms, call your physician or the staff at the Anticoagulation Service AS SOON AS POSSIBLE. You also need to call your physician or the Anticoagulation Service if you sustain any falls or injuries while taking this medication.

WARNING SIGNS OF BLEEDING

1. Excessive bleeding from your gums while brushing your teeth.
2. Frequent and severe bruising (bruises that get worse rather than better).
3. Nose bleeds for no reason.
4. Dark or bloody urine.
5. Black, tarry stools or obvious blood in your stools.
6. Sudden severe pain in any joint.
7. Unusual bleeding
8. Any injuries or falls causing problems which are unusual.

WHERE TO STORE YOUR COUMADIN®

It is important for you to keep this medication out of the reach of small children. If a child, or an adult, does swallow the medication, contact the person's personal physician or go to the nearest emergency room. ***As with any medication***, do not store Coumadin® in the bathroom, as moisture and temperature variations may make the medication less effective.

DRUGS TO AVOID WHILE TAKING COUMADIN®

There are several medications that alter the effectiveness of Coumadin® and should be avoided while on this medication. You should always consult your pharmacist or physician prior to taking any over-the-counter medications. If you have more than one physician, it is important that all your doctors are aware that you are on the medication, so they can avoid prescribing medications that will affect the way Coumadin® works. Aspirin, aspirin-containing, and aspirin-like medications (ibuprofen, Motrin®, etc.), and prolonged use of acetaminophen (Tylenol®) can all ***increase*** the effect of Coumadin®, and therefore should be avoided, unless prescribed by your physician. If one of these medications is prescribed, or any other medications are prescribed or deleted, please notify the staff at the Anticoagulation Service aware so that the necessary adjustments to your Coumadin® dose can be made.

HOW DIET AFFECTS COUMADIN®

Changes in diet may also effect the way Coumadin® works. It is important to maintain a steady, well-balanced diet. Too many or erratic consumption of leafy green (dark) vegetables on consecutive days may alter the INR; therefore you should maintain a consistent weekly balance of vegetables.

Alcohol can also increase the INR, as well as increase the risk of bleeding should you fall or injure yourself. Alcohol should be avoided while taking Coumadin®.

COUMADIN® IDENTIFICATION

It is always a good idea to have some type of identification that states you are on this medication in case an accident or injury occurs. It is also important that all emergency workers and doctors are aware that you take this medication. Medic-Alert® bracelets are available for Coumadin® patients and provide an easily recognized method of identification. Check your local pharmacy for these or call: Medic-Alert®, toll free at 1-800-432-5378.

ORAL ANTICOAGULATION
ENCOUNTER FORM

Patient Name _____ Provider _____

Date ____ / ____ / ____ Reviewed by_____

History Source _____

Contact Person/Agency _____

Primary Indication _____

Secondary Indication _____

Target INR ☐ 2.5 (2.0 – 3.0) ☐ 3.0 (2.5 – 3.5) ☐ Other _____

Anticoag Duration _____

Expected D/C _____

Subjective

Signs of Bleeding ☐ No ☐ Yes _____

Other Adverse ☐ No ☐ Yes _____

Recent Injuries/Falls ☐ No ☐ Yes _____

Acute Illness ☐ No ☐ Yes _____

Diet Changes ☐ No ☐ Yes _____

Alcohol Use ☐ No ☐ Yes _____

OTC Use ☐ No ☐ Yes _____

Herbal Medicines ☐ No ☐ Yes _____

Changes in Rx Meds ☐ No ☐ Yes _____

Symptoms of Thromboembolism

Weakness/Numbness/Tingling ☐ No ☐ Yes _____

Blurred Vision ☐ No ☐ Yes _____

Slurred Speech ☐ No ☐ Yes _____

Dizziness ☐ No ☐ Yes _____

Left leg pain/swelling ☐ No ☐ Yes _____

Right leg pain/swelling ☐ No ☐ Yes _____

Dyspnea ☐ No ☐ Yes _____

Chest pain ☐ No ☐ Yes _____

Medications	**Allergies**

Laboratory / Vitals

Lab Name _____ Collect date: _____ Request date: _____

PT / INR _____ / _____ PTT _____ Bleeding Time _____

Ht _____ Wt _____ Temp _____ Temp site _____ Pulse _____ Resp _____

BP (sitting) _____ / _____ BP (standing) _____ / _____ Hgb _____ Hct _____

Physical Exam

Findings:

Assessment / Plan

Compliance ☐ Adequate ☐ Poor _____

Coumadin tablet strength _____ mg

Current Dose Su ☐ M ☐ T ☐ W ☐ Th ☐ F ☐ S ☐

_____ mg/wk

New Dose Su ☐ M ☐ T ☐ W ☐ Th ☐ F ☐ S ☐

_____ mg/wk

Potential Significant Drug Interactions? None ☐ _____

Comments:

Special Instructions:

Disposition

Repeat INR _____ ☐ days ☐ wks ☐ mo Next INR _____

Contacted _____ By _____ Date _____

ANTICOAGULATION FLOW SHEET

Patient's Name: **DOB:**

Indication(s):

Target INR: ☐ *2.5 (2.0 - 3.0)* ☐ *3.0 (2.5 - 3.5)* ☐ *Other* _____

Date	INR	New Dose	Next INR	Comments	Init

REFERENCES

Oral Anticoagulation

Ansell JE, Buttaro ML, Thomas OV, Knowlton CH, and the Anticoagulation Guidelines Task Force. Consensus guidelines for coordinated outpatient oral anticoagulation therapy management. Ann Pharmacother 1997; 31:604-15.

Bristol-Myers Squibb Company (2007). Anticoagulant: Coumadin®. Retrieved 01/08/2008, from http://www.fda.gov/cder/foi/label/2007/009218s105lblv2.pdf

Chiquette E, Amato MG, Bussey HI. Comparison of an anticoagulation clinic with usual medical care. Anticoagulation control, patient outcomes, and health care costs. Arch Intern Med; 158:1641-7.

Crabtree M.D., Daniel (2008). Personal Communication.

DuPont Pharma. Dietary interactions with coumadin. Coumadin supporting material. 1996.

DuPont Pharma. Managing drug interactions of coumadin. Coumadin supporting materials. 1997.

Fifth ACCP consensus conference on antithrombotic therapy. Chest 1998; 114(suppl):439S-769S.

Haas S, Prevention of venous thromboembolism: recommendations based on the International Consensus and the American College of Chest Physicians Sixth Consensus Conference on Antithrombotic Therapy. *Clin Appl Thromb Hemost* – 01 July-2001; 7(3): 171-7

Havrda DE, Anderson JR, Talbert RL. Thrombosis. In: Pharmacotherapy Self-Assessment Program (PSAP) 3rd edition; Module 1:Cardiovascular. Carter BL, Lake KD, Raebel MA, eds. 1998:207-51.

Patel, Apurva (2005). Personal Communication.

Wilson-Norton JL, Gibson DL. Establishing an outpatient anticoagulation clinic in a community hospital. Am Journal Health-Syst Pharm 1996; 53:1151-7.