

**PROTOCOL NUMBER:**

7

**PROTOCOL TITLE:**

Ambulatory Initiation and Management of Warfarin for Adults

**THIS PROTOCOL APPLIES TO:**

UW Health Clinics: all adult outpatients with an active order for warfarin

**TARGET PATIENT POPULATION:**

Adult patients initiated or managed on warfarin

**PROTOCOL CHAMPIONS:**

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**PURPOSE STATEMENT:**

This protocol will delegate authority to trained health care providers in the initiation, patient assessment, dose adjustment and monitoring of warfarin therapy.

**WHO MAY CARRY OUT THIS PROTOCOL:**

Nurses and Pharmacists licensed in their respective fields in the state of Wisconsin who have documented completion of warfarin training, passed competency and a minimum of 5 patient cases resulting in warfarin dose adjustments reviewed and approved by the identified responsible physician or designee.

**GUIDELINES FOR PROTOCOL IMPLEMENTATION: (step by step instructions):**

**A. Protocol Initiation**

1. A physician initiates the protocol by entering the "Enroll In Anticoagulation" order AND selecting "YES" to the question for delegation of the warfarin management to either an RN or RPH.
  - i. All patients receiving warfarin should be managed through the anticoagulation episodes of care and will require the "Enroll in Anticoagulation" order. For patients not managed per protocol the delegation question should be answered with a "NO."
  - ii. This order is then sent via in-basket message to the RN or RPH
2. The RN or RPH may enter the "Enroll" order for the physician to delegate warfarin management.
  - i. The RN or RPH could enter the "Enroll In Anticoagulation" order, answer the delegation question with a "YES" and send the order to the physician for co-signature.
3. Within the "Enroll In Anticoagulation" order the target INR range, warfarin indication, anticipated duration of anticoagulation or review date, and date of first INR fields are available and should be completed by the ordering provider.
4. Additional communication may be added to the "Enroll In Anticoagulation" order by entering the smart text .anticoagpatientrisks to the processing instructions section.
  - i. This smart text will populate questions for bridge therapy, bleed risk and compliance concerns that, if exist, should be communicated to the staff.

**B. Laboratory Monitoring - Prior to Initiating Warfarin**

1. A baseline INR must be resulted within the previous 30 days
2. CBC with platelets, ALT, total bilirubin, and creatinine must be resulted within the past 90 days
3. If no baseline of above is available the patient must be sent to lab prior to prescribing warfarin

4. For women of child bearing age a urine pregnancy test is recommended
5. For patients followed per protocol the RN or RPH may place these laboratory orders

**C. Warfarin Dosing - Per Protocol**

1. The physician will provide the initial warfarin dose, indication, and target INR goal before delegating management to the RN or RPH
  - i. A loading dose (> 10 mg) of warfarin is inappropriate and should not be used
2. Table 1 may be utilized to identify patients who may be potentially sensitive to warfarin
3. If the patient is within the first 7 days of therapy Table 2 should be utilized for dose adjustments and time to next INR draws
4. If the patient is greater than 7 days after initiating warfarin therapy dosing Tables 3-6 should be utilized for dose adjustments depending on target INR range and indication
  - i. For INR ranges that do not have corresponding dosing tables the same principles of adjusting the weekly dose by 10% for INR not in goal should be used
5. Warfarin doses must not be adjusted without a resulted INR
6. A stable warfarin patient is defined as a patient maintained on the same warfarin dose for at least 6 months
7. Missed doses, recent INR trends, changes in diet and/or activity, changes to medications, and symptoms of bleeding or clotting should be taken into account before making a dosing change.
  - i. Refer to Appendix A for a complete list of patient assessment questions

**D. Warfarin Dosing - NOT on Protocol**

1. The physician or NP/PA will initiate and adjust warfarin doses based on a current INR and recommend a time for next INR check.
  - i. A loading dose (> 10 mg) of warfarin is inappropriate and should not be used
2. Missed doses, recent INR trends, changes in diet and/or activity, changes to medications, and symptoms of bleeding or clotting should be taken into account before making a dosing change.
  - i. The RN or RPH may still complete the patient assessment on each resulted INR for warfarin management. All findings must be sent to the provider.
  - ii. A LPN or MA may administer the questions to the patient but may not complete an assessment of the patient. All findings must be sent to the provider for assessment.
  - iii. Refer to Appendix A for a complete list of patient assessment questions
3. The RN, RPH, LPN, or MA may instruct the patient with warfarin dosing instructions from their provider.

**E. Documentation**

1. For all patients on warfarin the following should be documented in the anticoagulation episode of care in the electronic medical record
  - i. Indication for anticoagulation
  - ii. Target INR range
  - iii. Anticipated duration of anticoagulation or review date
  - iv. Current warfarin dose
  - v. Current INR
  - vi. Warfarin tablet strength
  - vii. Telephone contact for the patient

2. At each patient encounter for INR monitoring patients must be assessed for changes that could effect warfarin dosing
  - i. For all non-stable patients (defined in Section C) a full patient assessment must be completed and documented in the progress note
    - Refer to Appendix A for a list of the full patient assessment questions
  - ii. For all stable patients (defined in Section C) a full assessment is preferred but if not possible an abbreviated patient assessment **may** be substituted for the full assessment and documented in the progress note
    - Refer to Appendix B for a list of the abbreviated patient assessment questions
    - All stable patients must have 1 full assessment completed and documented at least every 6 months.
3. Each encounter for anticoagulation management should be linked to the anticoagulation episode of care within the electronic medical record
4. Follow up on INRs for warfarin management may be completed via telephone conversation or scheduled clinic visit and will occur within 24 hours of the reported INR result.
5. Patients will be considered unreachable when at least 1 attempt on 3 consecutive business days (3 separate attempts) have been unsuccessful in contacting the patient
  - i. Messages may be left for patients who have given prior authorization
  - ii. If a message is not left than a standardized letter will be sent to the patient with instructions for follow up
  - iii. Letters may be sent to the patient's home address or electronically if available (via My Chart)
  - iv. Documentation of contact attempts and messages will be included in the progress note
6. For patients not managed per RN/RPH protocol the encounter must be sent to the provider for co-signature
7. Patients should be assessed at least once a year for anticoagulation indication and length of therapy by a physician or mid-level provider

#### **F. Laboratory Monitoring - Maintenance**

1. The RN or RPH managing warfarin will instruct the patient on INR monitoring
  - i. Table 7 for newly initiated patients who have not achieved a stable warfarin dose
  - ii. Tables 8 for stable patients with a consistent warfarin dose
2. An INR must be checked at least every 6-8 weeks in a stable patient
  - i. If a previously stable patient has 1 out of range INR and are either maintained on the same dose or had a temporary dose change (hold or extra dose x 1), they are still be considered stable.
  - ii. If a previously stable patient has 1 out of range INR requiring an adjustment to their maintenance dose, they can be considered stable after 3 months on the same warfarin dose.
3. The date for the next INR check must be documented in the electronic medical record
4. For clinics utilizing point of care "fingerstick" testing machines, if the reported INR is above the defined accuracy result per machine, a repeat venipuncture is required to verify the INR result. Use the repeated venipuncture INR to determine if a dose change is needed.

## **G. Patient Education**

1. For all patients started on warfarin, patient education that highlights the importance of the following should be completed:
  - i. Follow-up
  - ii. Monitoring
  - iii. Compliance
  - iv. Dietary restrictions
  - v. Potential for drug interactions
  - vi. Potential adverse reactions
2. Documentation of patient education should occur in the electronic medical record
3. Educational materials for warfarin and parenteral anticoagulants have been created for use
  - i. Warfarin Patient Education Booklet: Health Facts For You #6900
  - ii. Parenteral Anticoagulation: Health Facts For You #6915
  - iii. Warfarin Patient Education Video: available on [www.uwhealth.org/anticoagulation](http://www.uwhealth.org/anticoagulation)

## **H. Transition Therapy**

1. Periprocedural anticoagulation should be individualized for each patient depending on bleeding risk of procedure and risk factors for thromboembolism
2. For patients followed per protocol each individual clinic will determine who develops the periprocedural anticoagulation plan

## **I. Medication Prescribing and Renewal**

1. For patients followed per protocol the following prescriptions may be prescribed or renewed by the RN or RPH:
  - i. Warfarin (Coumadin<sup>®</sup>)
  - ii. Low Molecular Weight Heparins
    - Dalteparin (Fragmin<sup>®</sup>)
    - Enoxaparin (Lovenox<sup>®</sup>)
  - iii. Fondaparinux (Arixtra<sup>®</sup>)
  - iv. Phytonadione (Vitamin K<sup>®</sup>)
2. All medication renewals are documented in the electronic medical record  
Documentation includes:
  - i. Name of medication
  - ii. Dose, frequency, and directions
  - iii. Quantity of tabs per month supply and number of refills
  - iv. Ordering provider's name
  - v. Pharmacy name and phone/fax number
  - vi. Name of person authorizing refill
3. Clinic staff may take messages/faxes from patients and pharmacies regarding script renewal and will forward these requests to the RN or RPH for completion.
4. Clinic RN or RPH will complete the requested prescription renewal during normal clinic hours and within 48 hours, unless marked as urgent

**Table 1. Factors for Identifying Warfarin Sensitive Patients**

<b>High Sensitivity Warfarin</b>	<b>Low Sensitivity Warfarin</b>
Baseline INR $\geq$ 1.5	Baseline INR < 1.5
Age > 65	Age $\leq$ 65
Actual body weight < 45 kg or actual < ideal	No other risk factors
Malnourished/ NPO >3 days	
Hypoalbuminemia <2 g/dl	
Chronic diarrhea	
Significant drug interactions (see Table 7)	
Decompensated heart failure	
Cancer	
Current antiplatelet therapy	
Thrombocytopenia: platelet <75 K/uL	
Alcohol abuse history	
Significant hepatic disease: cirrhosis or total bilirubin >2.4 mg/dl	
End stage renal disease	
GI bleed within past 30 days	
Surgery within past 2 weeks	
Intracranial bleed within past 30 days	

**Table 2. Warfarin Initiation Dosing Protocol (Week 1) with INR Goal 2-3**

<b>Day Therapy</b>	<b>INR Value</b>	<b>Dose Adjustment</b>
Day 1		5 mg daily (2.5 mg daily if high sensitivity to warfarin identified)
In 2-3 days after initiation	< 1.5 1.5-1.9 2.0-2.5 2.5-3.0 > 3.0	5 – 7.5 mg daily 2.5 - 5 mg daily 2.5 mg daily 0-2.5 mg daily Hold and recheck INR next day
In additional 2-3 days after last INR check	< 1.5 1.5-1.9 2.0-3.0 > 3.0	7.5 – 10 mg daily 5 – 10 mg daily 2.5 – 5 mg daily Hold warfarin, recheck in 1-2 days

**Table 3. Warfarin Maintenance Dosing Protocol with INR Goal 1.5 – 2.0**

INR ≤ 1.2	INR 1.3 -1.4 <sup>†</sup>	INR 1.5 - 2.0	INR 2.1 – 3.0 <sup>†</sup>	INR 3.1 - 4.0*	INR 4.1-5.0*	INR 5.1-9.0*	INR > 9.0
Increase weekly dose 10%	Increase weekly dose 5%	No change	Decrease weekly dose 5%	Consider half dose x 1 and Decrease weekly dose 10%	Hold 1 dose Decrease weekly dose by 10-20%	<b>MD order required</b> Consider: Hold 2 doses Decrease weekly dose 10-20% Check Hct	Contact MD for urgent patient evaluation

**Table 4. Warfarin Maintenance Dosing Protocol with INR Goal 2-3**

INR < 1.5	INR 1.5 - 1.9 <sup>†</sup>	INR 2.0 - 3.0	INR 3.1- 4.0* <sup>†</sup>	INR 4.1-5.0*	INR 5.1- 9.0*	INR > 9.0
Extra Dose Increase weekly dose 10-20%	Increase weekly dose 5-10%	No change	Decrease weekly dose 5-10%	Hold 1 dose Decrease weekly dose 10%	<b>MD order required</b> Consider: Hold 2 doses Decrease weekly dose 10-20% Check Hct	Contact MD for urgent patient evaluation

**Table 5. Warfarin Maintenance Dosing Protocol with INR Goal 2.5-3.5**

INR < 1.9	INR 1.9 - 2.4 <sup>†</sup>	INR 2.5 - 3.5	INR 3.6 - 4.5* <sup>†</sup>	INR 4.6-5.0*	INR 5.1- 9.0*	INR > 9.0
Extra Dose Increase weekly dose 10-20%	Increase weekly dose 5-10%	No change	Decrease weekly dose 5-10%	Hold 1 dose Decrease weekly dose 10%	<b>MD order required</b> Consider: Hold 2 doses Decrease weekly dose 10-20% Check Hct	Contact MD for urgent patient evaluation

\* If the INR is above the specified range for accuracy per POC device, a repeat venipuncture is required to verify INR

† See Table 6.

**Table 6. All INR Ranges**

If INR is above or below therapeutic range ≤ 0.5 and previously stable or there is a specific reason for INR to be out of range (ex. missed dose), continue current dose and test INR in 1-2 weeks
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## **MONITORING RECOMMENDATIONS**

**Table 7. Frequency of INR Monitoring After Initiation of Warfarin**

INR Check	
Every 2 – 3 days	Until INR within therapeutic range on 2 consecutive INR checks
Then every week	Until INR within therapeutic range on 2 consecutive INR checks
Then every 2 weeks	Until INR within therapeutic range on 2 consecutive INR checks
Then every 4 weeks	When dose is stable check monthly

**Table 8. Frequency of INR Monitoring for Maintenance of Warfarin**

INR Check	
In 1 week	If dose adjusted by 10-20%, starting or stopping an interacting medication, change in diet, change in activity level or other change that could affect INR
Every 1-2 weeks	If dose adjusted by 5-10%
Every 4 weeks	If maintained on same stable dose < than 6 months
Every 6-8 weeks*	If maintained on same stable dose for at least 6 months

\*If INR stable every 6 weeks x 2 consecutive checks then may consider every 8 weeks.

## **Collateral Documents/Tools:**

### **Full Patient Assessment Tool**

1. Verify patient dose (patient repeats what dose they have been taking)
2. Missed doses: Y/N
3. Medication Changes Y/N
4. Changes in diet/alcohol: Y/N
5. Recent Illness Y/N *If yes identify symptoms*
  - Diarrhea
  - Nausea/Vomiting
  - Fever
  - Hospitalization
6. Abnormal bleeding/bruising Y/N *If yes identify site*
  - Nose
  - Sputum/Emesis
  - Urine/Stool
  - Bruising
  - Other
7. Falls/Injuries Y/N
8. New Pain: Y/N *If yes identify site*
  - Chest
  - Headache
  - Leg
  - Other
9. Shortness of Breath: Y/N
10. Neurological changes: Y/N *If yes identify symptoms*
  - Dizziness
  - Numbness
  - Vision changes
  - Confusion/Slurred speech
  - Other
11. Upcoming surgery or procedures: Y/N
12. Change in medical condition: Y/N

**Appendix. B Abbreviated Patient Assessment Tool (Stable Patients)**

1. Verify patient dose (patient repeats what dose they have been taking)
2. Medication Changes Y/N
3. Upcoming surgery or procedures: Y/N
4. Bruising/bleeding or other concerns Y/N

**REFERENCES:**

1. Holbrook A, Schulman S, Witt D, Vandvik P, et al.,. Evidence Based Management of Anticoagulant Therapy: Antithrombotic Therapy and Prevention of Thrombosis, American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (9<sup>th</sup> Edition). *Chest*. 2012; 141:152s-184s.
2. Ageno W, Gallus A, Wittkowsky A, Crowther M, et al. Oral Anticoagulant Therapy: Antithrombotic Therapy and Prevention of Thrombosis American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (9<sup>th</sup> Edition). *Chest*. 2012; 141:44s-88s.
3. Holbrook AM, Pereira JA, Labiris R, et al. Systematic overview of warfarin and its drug and food interactions. *Arch Intern Med*. 2005; 165:1095-1106.
4. Wittkowsky AK. Drug interactions update: drug, herbs and oral anticoagulation. *J Thromb Thrombolysis*. 2001; 12:67-71.
5. Wittkowsky AK, Boccuzzi SJ, Wogen J, et al. Frequency of concurrent use of warfarin with potentially interacting drugs. *Pharmacotherapy*. 2004; 24:1668-1674.

**RESPONSIBLE/AUTHORING DEPARTMENT:**

Pharmacy Department

**APPROVING COMMITTEE:**

Ambulatory Anticoagulation Committee  
UW Health Ambulatory Protocol Committee  
Pharmacy and Therapeutics Committee  
UWHC Medical Board

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