

# MNMC Pharmacy Ambulatory Anticoagulation Clinic Policy and Procedure Pharmacy A-01

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## Section 1.01 DESCRIPTION

The Pharmacy Department of Mount Nittany Medical Center (*MNMC*) will conduct the out-patient Anticoagulation Clinic (*AC Clinic*). The AC Clinic serves as a referral service for the patient population primarily, but not limited to, central Pennsylvania necessitating anticoagulation therapy.

## Section 1.02 OBJECTIVE

- ◆ To implement anticoagulation therapy and manage according to evidence based guidelines.
- ◆ To maximize the benefits of anticoagulation therapy through patient education & assessment of patient response.
- ◆ To minimize the adverse effects of anticoagulation through patient education & involvement, & laboratory monitoring.
- ◆ To provide a reliable source of drug information to patients & other healthcare providers.
- ◆ To assist healthcare providers in the management of patients prescribed anticoagulants.

## Section 1.03 STAFFING & CREDENTIALS

The AC Clinic is managed by a pharmacy anticoagulation clinical coordinator & physician medical director that is on-site or readily available at any point in time. Pharmacists of the MNMC staff the AC Clinic. A list of pharmacists approved to provide patient care in the AC Clinic is maintained/updated yearly (*AC Clinic Cover Page*). Pharmacists have received specialized training involving anticoagulation management in order to care for patients enrolled in the AC Clinic. This may include, but not limited to: a preceptorship anticoagulation program, pharmacy practice residency, review/completion of appropriate PSAP anticoagulation modules, or Certified Anticoagulant Care Provider (*CACP*) credential. All AC Clinic pharmacists receive initial specialized, on-site training with yearly competencies (*via HealthStream*).

Professional liability insurance coverage in the minimum amount of one million dollars per occurrence or claims made is maintained by Mount Nittany Medical Center. *A copy of this insurance coverage is available upon request.*

Under the direct guidance of an AC Clinic pharmacist or physician medical director, medical students, pharmacy interns/residents may observe & participate in patient management.

## Section 1.04 REFERRAL & SCHEDULING

Contact information for the AC Clinic:

- Phone: 814.234.6180
- Fax: 814.234.6775
- Email: [ACClinic@mounnittany.org](mailto:ACClinic@mounnittany.org)
- Web: [www.mounnittany.org/anticoag](http://www.mounnittany.org/anticoag)

The AC Clinic is open Monday through Friday (*non-holiday*) during the day. For patients unable to reach the AC Clinic in an emergency (*ex: after hours/holiday/weekend*), education is provided for patients to call 911 or go to the nearest emergency department.

Patients will be voluntarily referred for anticoagulation services at the discretion of the licensed healthcare provider in active practice and within the scope of their current practice. These will be healthcare providers in the EHR (*Meditech Expanse*) provider dictionary that have active licensing capabilities (*NPI, etc.*). In the majority of cases, anticoagulation therapy has been initiated by the referring provider (*or Emergency Department*) prior to the 1<sup>st</sup> visit to AC Clinic. In an exceptional case, the initiation of therapy can be performed by the AC Clinic physician medical director, provided a consultation/referral has been completed by the referring provider.

Referral to the MNMC AC Clinic is completed electronically via Expanse (*available for ambulatory MNH*) or via paper referral (*PH-075 AC Clinic Referral Form*) (*available for acute or outside MNH*) as a signed order that consults the MNMC AC Clinic for new or ongoing anticoagulation management and therapeutic monitoring when indicated. It also verifies review of AC Clinic policy & procedure available at [www.mountrittany.org/anticoag](http://www.mountrittany.org/anticoag). A paper copy is readily available upon request. Upon request, AC Clinic is able to provide an active list of referring, licensed healthcare providers who are party to this agreement. The anticoagulation referral is reviewed every two years on or about the anniversary of enrollment, to determine if changes to evidence based practices warrant changes or review of therapy. Additionally, a new referral is warranted should there be a change in the anticoagulant recommended or the target therapeutic range.

The instructions for referring a new patient are detailed on the [AC Clinic--referring new patient webpage](#). This website includes all the pertinent information necessary to complete the referral process including the AC Clinic policy & procedure (*provider collaborative agreement*) and instructs the referring provider to set up the patient's 1<sup>st</sup> appointment via MNMC Central Scheduling (*phone 814.234.6106*) to allow for appropriate transition of care. This enables the referring provider to determine the duration of time to continue to manage anticoagulation until the AC Clinic takes over. Subsequent appointments are then coordinated through the AC Clinic with the patient. If the patient does not show up for the 1<sup>st</sup> appointment as scheduled, the referring provider's office is notified and a reassessment &/or reschedule is planned.

Subsequent appointments to the AC Clinic will be scheduled at the completion of each anticoagulation visit by the AC Clinic team. Patients who are scheduled at hospital discharge should have follow-up within 5 days of discharge. The initial patient visit will be approximately 45-60 minutes and will involve an extensive interaction with the AC Clinic medical director or AC Clinic pharmacist who will obtain a detailed history & provide patient education about the disease state and anticoagulant therapy. Also during the initial visit, the patient will review/sign a patient compliance agreement form (*PH-078 AC Clinic Request for Warfarin Monitoring*), which details the patient's responsibilities while they are enrolled in the AC Clinic. These responsibilities help ensure the patient's safety by making them aware of the potentially serious adverse effects involved in taking anticoagulation therapy *without* careful monitoring. Each follow-up visit will be a session where the pharmacist will screen for therapy-associated problems; anticoagulation adherence; provide ongoing education; assess changes in diet and drug therapy as well as screen for drug interactions; and adjust the dose of anticoagulation therapy accordingly if necessary. Additionally, patients may be enrolled in the AC Clinic by voluntary consultation request (*defined above*) by acute care providers or by providers in the MNMC Emergency Department. These patients will be seen according to availability of pharmacy anticoagulation staff.

The AC Clinic has knowledge in patient self-testing/self-management options. At this time, we do not manage patients enrolled in self-test/self-management programs. This option may be reassessed on a case-by-case basis by the AC Clinic physician medical director.

The AC Clinic does manage current patients with acute requirements for home health services (*s/p surgery, recent hospital stay, etc.*). It is preferred that the home health services are used only acutely. POC lab results may be called to the AC Clinic, however; faxed copies of the results are mandatory to facilitate patient follow up. All faxed results via home health will have patient follow up within 24 hours, preferably same day when possible. It is preferred that labs obtained via home health are drawn in the morning to facilitate same day follow up with the patient/caretaker.

The AC Clinic also offers remote monitoring of anticoagulation therapy for patients temporarily residing long distances from home. This is defined in the “Anticoagulation Protocol for Monitoring Patients Long Distance Policy/Patient contract (See [Snowbird Policy](#)).

## Section 1.05 CLINIC PROCEDURES

Patient specific management or alterations to outpatient anticoagulation therapy for patients necessitating a transition of care (*ex: higher level of care, or acuity*) will be reviewed and assessed by the licensed provider in that transition of care. Recommendations for coordination of anticoagulation management is available upon request to the MNMC AC Clinic. Current documentation of anticoagulation management is readily retrieved and available in the MNMC EHR (*Meditech Expanse*).

### **Warfarin**

Blood for determination of International Normalized Ratio (INR) will be drawn primarily during the AC Clinic visit by approved clinic staff with a point of care (POC) device or alternatively by the hospital laboratory should additional or verification studies be warranted. INR obtained via home health/outside laboratory may also be utilized. An interview and evaluation will take place in clinic, and only if, the patient is unable to come to the clinic, a phone interview will suffice. Anticoagulant dosages will be maintained or altered by the pharmacist based on laboratory data, POC results, &/or other information obtained during the patient assessment.

The POC device used in the AC Clinic is a moderate complexity CLIA-waived device and approved by the MNMC laboratory POC Coordinator to comply with applicable CAP requirements. Currently, the AC Clinic uses a Roche Diagnostic CoaguChek-XS Pro System (*or similar*). This device enables the AC Clinic pharmacist to monitor the patient’s INR by finger-stick rather than venipuncture. The obtained INR results will be reviewed directly by the AC Clinic pharmacist. The patient’s therapy will be evaluated and either maintained or altered based on these results and the information obtained during the patient assessment. Any INR that is suspect for error, as determined by the POC device or AC Clinic pharmacist, or INR 5.0 or above (*whenever possible*), will be re-run by the hospital laboratory via venipuncture for confirmation/validation.

### ◆ **Monitoring and Evaluation**

Each patient will be individually evaluated based on the patient’s INR results & the patient interview. Initial monitoring may be conducted on at least a weekly basis. The frequency of monitoring will decrease, as the patient’s INR becomes therapeutic and stable. The maximum length of time between scheduled INRs will be one month. Maintenance appointments longer than one month will be assessed on a *case-by-case* basis by the AC Clinic pharmacist and reviewed/approved by the AC Clinic physician medical director.

Criteria for extended warfarin monitoring necessitate patient education to notify AC Clinic of:

- Changes in **prescription &/or over the counter medications** (*including dosages*). Especially:
  - ✓ Antibiotics (*even if only for a few days*)
  - ✓ Non-steroidal anti-inflammatory drugs (*NSAIDS, such as ibuprofen, aspirin*)
  - ✓ Steroids (*such as prednisone*)
  - ✓ Cholesterol drugs (*so called “statins”*)
  - ✓ Seizure medications
  - ✓ Vitamins and herbals
- Have gastrointestinal illness (*diarrhea or vomiting*) lasting over 72 hours
- Have red blood in the urine/stool or black/sticky/“tarry” stool or “coffee ground” emesis.
- Have bruising not explained by simple trauma or injury or an unprovoked nosebleed.
- Have an new injury or other condition necessitating *acetaminophen (Tylenol™) containing products*
- Plan an extended trip or vacation
- Have knowledge of upcoming test/procedure that may require discontinuing or adjustment in anticoagulation therapy.
- Change in eating/drinking habits (*including weight loss diets, nutritional supplements, or a change in alcohol consumption*)

Patient **MUST** seek immediate, emergency medical attention if:

- Have pain, tenderness, redness, heat or swelling in legs or arms
- Suffer a serious fall, *in particular should they hit their head/neck*
- Have chest pain, discomfort or shortness of breath
- Have dizziness, numbness, tingling, slurred or difficulty speaking or loss of function or sensation in extremities

Criteria used to assess the patient's response to therapy & detect existing or potential problems will be as follows:

1. Signs and symptoms of hemorrhage or acute thromboembolism (*Appendix-1*)
2. Changes in patient condition requiring warfarin therapy
3. Change in patient medical conditions, whether a new health problem or a change in an existing condition, &/or recent emergency-care or hospital admission
4. Alterations in diet, smoking, or alcohol intake
5. Changes in &/or addition to medication therapy, whether prescription, non-prescription/herbal therapy.
6. Upcoming extended travel resulting in missed appointments
7. Upcoming invasive procedures requiring cessation of warfarin and bridge therapy assessment with initiation/maintenance.
8. Adherence vs, non-adherence with therapy
9. Skin changes suspicious for warfarin associated skin necrosis or possible "purple toe" syndrome
10. Blood pressure monitoring
11. Heart rate monitoring may be performed and recorded at patient's request or AC Clinic discretion (e.g., *symptomatic*)
12. Pregnancy or planned pregnancy

#### ◆ Therapeutic Adjustments in Warfarin Therapy

A patient's warfarin regimen will be designed to maintain an INR within the established guidelines recommended by evidence based guidelines ([Recommendations for Chronic Oral Antithrombotic Therapy](#)), unless otherwise specified by the referring physician &/or the AC Clinic medical director.

The desired INR may vary based on patient response & history, new clinical data, or the clinical judgment of the AC Clinic physician medical director &/or referring physician. When a patient who has been stable and within range on their current warfarin dose, presents with an INR outside their desired range, the patient will be evaluated to determine any possible altering factors. Based on this assessment one of the following decisions will be made:

- a) If the altering factor(s) for the non-therapeutic INR is identified, an effort will be made to correct/control the factor prior to changing the dose.
- b) When the INR is BELOW the desired range, there are no signs and symptoms of acute thromboembolism, and factors known to lower the INR are ruled out, the warfarin dose may be maintained or increased based on the individual's past dose-response data &/or the warfarin dosing nomogram.
- c) When the INR is ABOVE the desired range, there are no signs or symptoms of hemorrhage, and factors known to increase INR are ruled out, the warfarin dose may be maintained or decreased based on the individual's past dose-response data &/or the warfarin dosing nomogram.
- d) If the INR is supra-therapeutic, or at a rapid rate of rise, warfarin therapy may be held for a period of time determined appropriate by the AC Clinic pharmacist/physician medical director (*normally 1-3 days*) after which the warfarin therapy will be resumed at the same or lower dose according to the individual's past dose-response data &/or the warfarin dosing nomogram. In some cases, a mild-moderate elevation may be corrected by using a partial dose on a singular occasion.
- e) Patients with a supratherapeutic INR will all be evaluated for the need to reverse or partially reverse the INR with oral Vitamin K (*routinely stocked in the clinic*). This decision will be made by the AC Clinic medical director and will be based on the degree of elevation, the presence of minor bleeding and the patient's individual risk factors for bleeding.
- f) For any critical elevation in the INR, a reassessment of dose stability, time in therapeutic range and indication for anticoagulation is performed. Consideration will be given to switching to an alternative anticoagulant therapy.

- g) If the INR is sub-therapeutic, or at a rapid rate of decline, the AC Clinic pharmacist/physician medical director may determine it appropriate to give an additional 0-2 doses of warfarin (as loading doses) and resume the same or increased dose according to the individual's past dose-response data &/or the warfarin dosing nomogram. **The possible need for bridge therapy with an alternative anticoagulant during this time will be assessed on an individual basis and discussed/approved with the AC Clinic physician medical director.**
- h) The AC Clinic physician medical director will be notified to assess/approve plan of care in any of the following situations (or referring provider if AC Clinic physician medical director is unavailable):
1. Actual or suspected signs or symptoms of hemorrhage
  2. Actual or suspected signs or symptoms of thromboembolism
  3. INR 5.0 & above, with/without bleeding
  4. Any situation involving possible administration of oral Vitamin-K
  5. INR below 2.0 in patients with goal INR range 2.5-3.5 or above
  6. INR 1.5 or below in patients with goal INR range 2-3
  7. Blood pressure reading of greater than 199mmHg (systolic) or 110mmHg (diastolic) on one occasion, or greater than 180mmHg (systolic) and 100mmHg (diastolic) on three consecutive occasions.
  8. Any situation recommended by the referring provider or deemed necessary by the AC Clinic pharmacist/physician medical director.

◆ **Procedure for Implementing Warfarin Changes**

As per evidence based guidelines, maintenance warfarin dosage changes will be made in small increments. Patients who have been previously stable and have a single INR  $\pm$  0.5 the therapeutic goal will not routinely have an adjustment made but will be re-evaluated in a timely manner determined by the AC Clinic pharmacist. Dosage changes will be evaluated on an individual basis. Changes will be made using data from the patient's past dose-response &/or the following dosage adjustment guidelines. *These dosing guidelines are for patients who are \*\*\*at steady-state\*\*\* with their warfarin therapy.*

**(i) Dosage Adjustment to Maintain INR Range of 2.0 – 3.0**

INR	below 1.5	*1.5 – 1.9	2.0 – 3.0	*3.1 – 3.5	3.6 – 4.0	above 4.0
Change	Reload x 1d Increase 5-20%	Increase 5-15%	No Change	Decrease 5-15%	Hold x 0-1d Decrease 10-15%	Hold x 1-3d Decrease 15-25%
Follow-up	1-2 weeks	2-3 weeks	4 weeks	2-3 weeks	2-3 weeks	2-10 days

\* Change may not be indicated in some patients due to high bleeding or embolic risk.

**(ii) Dosage Adjustment to Maintain INR Range of 2.5 – 3.5**

INR	below 1.5	1.5 – 1.9	*2.0 – 2.4	2.5 – 3.5	*3.6 – 4.6	4.7 – 5.2	Above 5.2
Change	Reload x2d Increase 15-25%	Reload x1d Increase 10-20%	Increase 5-15%	No Change	Decrease 5-15%	Hold x 1d Decrease 10-20%	Hold x 1-3d Decrease 10-25%
Follow-up	1 week	1-2 weeks	2-3 weeks	4 weeks	2-3 weeks	1-2 weeks	2-7 days

\* Change may not be indicated in some patients due to high bleeding or embolic risk.

- ◆ Each patient must be assessed *individually*
- ◆ Every patient should be assessed for any signs & symptoms of hemorrhage or thromboembolism (Appendix-1) prior to any dose adjustments.
- ◆ Patients will be given written dosing instructions on all dosage adjustments, *when applicable*.
- ◆ Patients with supra-therapeutic INRs will be assessed according to the management of nontherapeutic INRs (after AC Clinic physician medical director &/or referring provider contacted for INR 5.0 or above) (Appendix-2,3).

◆ **Procedures for Beginning Warfarin Anticoagulation Therapy in AC Clinic**

If the provider refers the patient to the AC Clinic for initiation of warfarin therapy, the following nomogram will be utilized. *These guidelines are generally applicable for the first 2-3 weeks of warfarin therapy.* Each patient must be individually assessed before any adjustments are made \*\*\* ALL patients will NOT apply to the same nomogram. \*\*\*

**Day #1:**

- 1) Provide anticoagulation patient education
- 2) Initiate warfarin therapy with adequate bridge anticoagulation (*if applicable*) based on evaluation of patient's risk factor(s) for warfarin sensitivity\*\*
  - Most patients: **5mg daily starting dose.**
  - Otherwise healthy (*low to moderate risk of bleeding*): **7.5-10mg daily X 2 doses with anticoagulation urgency.**
  - High bleed risk patients (*ex: elderly, malnourished, CHF, liver dz, interacting meds—amiodarone*): **Consider 2.5mg daily starting dose.**
- 3) Check PT/INR in 2-3 days



(In 2-3 days)

<i>If INR</i> above 3.0	Hold 1-3 doses, Decrease 50%, Re-check 3-5 days
2.5 – 3.0	Decrease 33-50%, Re-check 3-5 days
2.0 – 2.5	Decrease 25-33%, Re-check 3-5 days
1.5 – 2.0	No Change, Re-check 5 days
below 1.5	Reload x 1-2, Increase 0-33%, Re-check 3-5 days



(In 3-5 days)

<i>If INR</i> above 3.0	Hold 1-3 doses, Decrease 25-50%, Re-check 3-5 days
2.5 – 3.0	Decrease 0-50%, Re-check 3-5 days
2.0 – 2.5	No Change, Re-check 5-7 days
1.5 – 2.0	Reload x ½ - 1, No Change in dose, Re-check 5-7 days
below 1.5	Reload x ½ - 1, Increase 25-50%, Re-check 3-5 days



(In 3-7 days)

<i>If INR</i> above 3.0	Hold 1-3 doses, Decrease 10-33%, Re-check 3-7 days
2.0 – 3.0	No Change, Re-check 5-7 days
1.5 – 2.0	Reload x ½ - 1, Increase 0-20%, Re-check 5-7 days
Below 1.5	Reload x 1 - 2, Increase 15-50%, Re-check 5-7 days

**\*\*Factors increasing or decreasing warfarin sensitivity:**

*When determining the appropriate starting dose of warfarin and making dose adjustments, it is important to consider if the patient may have increased or decreased sensitivity to warfarin.*

**Higher Sensitivity (Consider lower starting dose)**

- Baseline INR >1.2
- Advanced age (>65yo)
- Female gender<sup>2</sup>
- Low body weight (<50kg)

**Lower Sensitivity (Consider higher starting dose)**

- Baseline INR < 1.2
- Younger age (<55yo)<sup>1</sup>
- Male gender<sup>2</sup>
- Weight > 90 kg<sup>2</sup>

Asian ancestry<sup>3</sup>  
 Recent surgery and blood loss<sup>2</sup>  
 Alcohol abuse<sup>4</sup>

African American ancestry<sup>2</sup>  
 Diet high in Vitamin K<sup>2</sup>

Acute illness (*diarrhea, infection, fever*)<sup>4</sup>  
 Impaired nutritional status (*npo>3 days, ↓ Vit K intake*)  
 Comorbidities: CHF, renal disease, liver disease, hypermetabolic state, cancer<sup>4</sup>  
 Concurrent use of medications known to increase INR (*see below*)

References:

1 Crowther MA et al. A Randomized Trial Comparing 5-mg and 10-mg Warfarin Loading Doses. Arch Intern Med. 1999;159:46-8.  
 2 Absher. Patient-specific factors predictive of warfarin dosage requirements. Ann Pharmacother. 2002 Oct;36(10):1512-7.  
 3 Dang. The influence of ethnicity on warfarin dosage requirement. Ann Pharmacother. 2005 Jun;39(6):1008-12. Epub 2005 Apr 26. doi: 10.1345/aph.1E566  
 4 White. Patient factors that influence warfarin dose response. J Pharm Pract. 2010 Jun;23(3):194-204. doi: 10.1177/0897190010362177. Epub 2010 May 6. doi: 10.1177/0897190010362177

**Drug interactions of MAJOR significance (not inclusive list):**

Sulfamethoxazole/trimethoprim (SMX/TMP)	↑↑ INR, monitor closely, consider ↓ dose &/or holding dose(s)
Metronidazole	↑↑ INR, monitor closely, consider ↓ dose &/or holding dose(s)
Amiodarone	↑↑ INR, monitor closely, consider ↓ dose &/or holding dose(s)
Erythromycin, Clarithromycin	↑↑ INR, monitor closely, consider ↓ dose &/or holding dose(s)
Fluoroquinolones ( <i>levofloxacin—preferred</i> )	↑↑ INR, monitor closely, consider ↓ dose &/or holding dose(s)
Clofibrate, Fenofibrate	↑↑ INR, monitor closely, consider ↓ dose &/or holding dose(s)
Fluconazole/Voriconazole	↑↑ INR, monitor closely, consider ↓ dose &/or holding dose(s)
Cimetidine	↑↑ INR, <i>avoid use</i>
Isoniazid	↑↑ INR, monitor closely, consider ↓ dose &/or holding dose(s)
Phenytoin	Initially ↑↑ INR, then ↓↓ INR, <i>monitor closely</i>
Prednisone	Variable effects, <i>monitor closely</i>
Rifampin	↓↓ INR, <i>delayed onset (~1-2wks), avoid use if possible</i>
Carbamazepine	↓↓ INR, <i>delayed onset (~1-2wks)</i>
Phenobarbital	↓↓ INR, <i>delayed onset (~1-2wks)</i>

◆ **Monitoring Frequency After Initiation of Warfarin Therapy**

Patients will generally be monitored at least weekly for the first couple weeks of therapy. Once an appropriate dose has been determined, the patient is at steady-state (*10-14 days*), and the target INR range is achieved, the monitoring interval may be extended to every 2 weeks. Once the patient has been in range for consecutive visits, or the AC Clinic pharmacist deems it to be appropriate, the interval between visits may be extended to 3-4 weeks. From here, further changes in the dosing interval will be made in accordance to the dosing guidelines.

◆ **Procedure for Discontinuing Therapy**

The planned duration of anticoagulation therapy will be determined initially by the referring provider on the anticoagulation referral form when the patient is voluntarily referred to the AC Clinic and periodically thereafter, depending on revision of published, evidence-based guidelines. When the patient reaches the end of the pre-determined period, the AC Clinic pharmacist or physician medical director will notify the referring provider for approval to discontinue warfarin (*or alternative anticoagulant therapy*). This notification will take place via Expanse—Workload (*if ambulatory MNH*) or a faxed notification if outside MNH.

The AC Clinic reserves the right to recommend removal of any patient from the AC Clinic. Reasons for this recommendation will be made specifically to the AC Clinic physician medical director & referring provider ([AC Clinic No Show Management](#)). Participation in the AC Clinic is voluntary, a patient or referring provider may “opt-out” or discontinue this service at any time period.

◆ **Holding Anticoagulation Therapy for Dental Work or Other Invasive Procedures**

Management of anticoagulation before & after dental procedures requires careful, patient-specific evaluation of the risk of bleeding associated with the dental procedure as well as the risk of thromboembolism associated with the underlying disease state for which anticoagulation is indicated. Patient specific management plans will

be made in consultation with the provider performing the procedure when indicated or requested and approved by the AC Clinic physician medical director working with the patient's cardiologist &/or the referring provider when indicated.

Anticoagulation &/or antiplatelet therapy *will not* be held for procedures by the AC Clinic pharmacist *without prior approval from the AC Clinic physician medical director.* Anticoagulation &/or antiplatelet therapy will be held for invasive procedures for a period of time determined appropriate for the patient. If full reversal is indicated, the patient's INR should be below 1.5 on the day of the procedure. Recommendations for invasive procedure anticoagulation &/or bridge therapy assessment (*thrombotic/hemorrhagic risk*) management, per the published evidence-based guidelines, can be obtained from the AC Clinic pharmacist/physician medical director upon request.

For dental procedures, anticoagulation therapy will be withheld in patients with a high risk of bleeding *only after* the approval of the AC Clinic physician medical director &/or the referring provider. Patients who are not considered to be at high risk for bleeding, it is recommended that therapy **NOT** be withheld in normal dental procedures. AC Clinic supports checking an INR in close proximity to a dental procedure (*within 5 days*) when patients remain on warfarin therapy *and have a history of labile INRs.* An INR is also reasonable if deemed *necessary by the provider performing the dental procedure.* Patients in whom local bleeding must be controlled, recommendations for the use of local measures to prevent or control bleeding (*ex: tranexamic acid or aminocaproic acid mouthwash, cold water rinse, local pressure, site packing, etc.*) can be obtained from the AC Clinic pharmacist/physician medical director without interrupting anticoagulation therapy. The chart below references target INR ranges for different dental procedures.

If anticoagulation therapy is held, it will be restarted the evening of the procedure unless excessive bleeding occurred, as determined by the provider performing the invasive dental procedure.

Suggestions for anticoagulation management before and after dental procedures:

UW Medicine Anticoagulation Services, <https://depts.washington.edu/anticoag/home/content/suggestions-anticoagulation-management-and-after-dental-procedures>:

- ❖ **LOW BLEEDING RISK:** supragingival scaling, simple restorations, local anesthetic injections
  - *Suggestions: Do not interrupt anticoagulant treatment, use local measures to prevent or control bleeding.*
- ❖ **MODERATE BLEEDING RISK:** subgingival scaling, restorations with subgingival preparations, standard root canal therapy, simple extractions (**1-2 teeth**), regional injections of local anesthetics.
  - *Suggestions:*
    - *Interruptions of warfarin therapy may be necessary*
    - *Use local measures to prevent or control bleeding*
    - *Consult with dentist to determine comfort with use of local measures to prevent bleeding when anticoagulation is **NOT** interrupted?*
- ❖ **HIGH BLEEDING RISK:** extensive surgery, apicoectomy (*root removal*), alveolar surgery (*bone removal*), multiple extractions.
  - *Suggestions:*
    - *May need to interrupt anticoagulant therapy or return to normal hemostasis*
    - *Use local measures to prevent or control bleeding*
    - *Consider bridge therapy plan determined by AC Clinic medical director/procedurist (if applicable).*

#### **LABORATORY MONITORING OF ANTICOAGULANT THERAPY:**

Pharmacist ordered lab work, *as it pertains to any anticoagulation therapy*, may include: POC INR, venous INR, CBC (*no diff*), Hgb/Hct, platelets, serum creatinine, estimate GFR, BMP, anti-factor Xa level (*LMWH/DOAC*). Additional studies may be ordered per consultation with AC Clinic medical director.

#### **MONITORING OF PATIENTS ON ALTERNATIVE ANTICOAGULANTS:**



### **Low Molecular Weight Heparins (LMWH) / fondaparinux (Arixtra)**

Patients who are taking LMWHs/fondaparinux long term will be followed periodically for assessment of their anticoagulation status and potential problems with **administration of** therapy. At the time of their evaluation, they will be assessed for signs and symptoms of acute bleeding/thrombosis, upcoming procedures & an evaluation of their injection sites will be performed. **For patients who are not already on LMWH, dose is determined based on the patient's indication for use, weight, and renal function.** Education is provided to include detailed instructions on self-injection technique as well as written instructions. **Laboratory studies that may be done to evaluate the anticoagulation status of patients include:** a CBC to assess hemoglobin/hematocrit (H/H) &/or platelet (PLT) counts, serum creat ( $S_{cr}$ ) to assess renal function, &/or heparin anti-factor-Xa level (*if required for LMWH*). Anti-factor Xa laboratory studies should be done at steady state (*after  $\geq 5$  daily doses or 8-10 twice daily doses*) and should be drawn ~4 hours after the last administered LMWH injection. The patient's weight will be obtained and blood pressure monitored. Lab studies, which are most commonly drawn by the MNMC lab, will be reviewed by the AC Clinic pharmacist or physician medical director. Any changes in anticoagulation therapy will be communicated by the pharmacist to the patient either via clinic visit or follow up telephone conversation.

Follow up evaluation intervals are largely dependent on the diagnosis and any co-morbid or potentially high risk conditions. The typical interval is 3 months, however pediatric or pregnant patients, patients with low or high body weights, renal insufficiency, or active cancer (*with thrombocytopenia*) may require more frequent visits.

### **Direct-Acting Oral Anticoagulants (DOACs)**<sup>5</sup>

The consideration for DOAC initiation/transition of therapy will be a discussion enrolled patients have with the AC Clinic medical director &/or anticoagulation pharmacist. This may take place during a patient's 1<sup>st</sup> visit to AC Clinic or at any time during their anticoagulation management. Consideration of appropriateness will include: **drug affordability**, baseline labs (*CBC/LFTs/ $S_{cr}$* ), estimation of creatinine clearance, medication review to assess potential for drug interactions, patient-specific criteria, a thorough review of indication of therapy, and patient education including importance of adherence will take place. The maintenance management plan of care for patients prescribed DOAC therapy will include routine follow-up with AC Clinic to monitor for adherence, **drug affordability**, thromboembolic events, bleeding events/risk factors, adverse effects, medication review, labwork (*CBC/ $S_{cr}$ /LFT when indicated*), as well as reassessment of appropriateness and duration of therapy.

**Follow-up intervals and testing for patients on DOAC therapy is based on criteria established by the American Society of Hematology and is dependent on serum creatinine:**

- Every 3 months (*patients with a CrCl  $<50$  mL/min*)
- Every 6 months (*patients with a CrCl  $\geq 50$  mL/min*)
- *Clinical judgment should be used to determine frequency of monitoring based on patient specific factors such as: overall health, adherence, and bleeding/thrombotic risk. These issues &/or additional concerns will be reviewed with the AC Clinic medical director to determine ongoing plan of care.*

## Section 1.06 DOCUMENTATION

All pertinent subjective & objective patient data will be documented &/or scanned (*if outside EHR*) into the patient EHR. Assessment at each AC Clinic visit including: medication review, therapy changes, results of laboratory work, POC testing, and any associated problems will be documented &/or scanned (*if outside EHR*) into the patient EHR following each patient encounter. This documentation is readily displayed from the patients EHR for providers with licensing privileges at MNH (*ex: emergency department, pre-admission testing, Mount Nittany Physician Group (MNPG) ambulatory offices*). The AC Clinic medical director will be contacted sooner to assess/approve plan of care in any of the situations listed in the Clinic Procedures section occurring that warrants timely follow-up (*or referring provider if AC Clinic physician medical director is unavailable*). The AC Clinic physician medical director routinely reviews patient encounters to AC Clinic.

## Section 1.07 FOLLOW-UP

The AC Clinic will schedule follow-up appointments for patients at the completion of each AC visit (*including follow up visits that take place over the phone*). Patients who are stable and in their designated INR range will be scheduled for routine maintenance follow ups. This time frame may be decreased with change in the patient's dose, unstable INR, high bleeding/thromboembolic risk, or anything the AC Clinic pharmacist/physician medical director deems necessary to decrease the follow-up time.

If the patient misses an appointment for a scheduled INR or clinic visit or fails to reschedule a previously booked AC Clinic appointment, attempts will be made to contact the patient (*ex: phone/mailed postcard/letter reminder*) per no show policy ([AC Clinic No Show Management](#)). **Documentation via EHR (Expanse Workload) is utilized.** An attempt will be made sooner in high-risk patients. In the event of repeated missed appointments **or failing to reschedule** that potentially compromise patient safety, the AC Clinic physician medical director &/or referring provider will be notified. This may lead to AC Clinic dismissal ([AC Clinic No Show Management](#)).

## Section 1.08 PATIENT EDUCATION

Patient anticoagulation education will be a continuous process that will be individualized to the patient's level of comprehension. Patients will be comprehensively educated at their initial encounter(s) and briefed at each subsequent visit. Areas of concern for the individual patient will be the educational focus at these visits. When necessary, the designated primary care-giver of the patient will be educated on the patient's anticoagulant therapy. The emphasis of the patient's education will be on the following:

- 1) Able to state drug name, strength, description (*color, etc.*)
- 2) Able to state daily dose (*amount/number of tabs*)
- 3) Able to state why they are on the medication
- 4) Able to state symptoms of dose too high/low
- 5) Able to state symptoms of bleeding and procedures to follow for bleed.
- 6) Interactions, including drugs (*prescription/non-prescription/herbal therapy*), use of non-steroidal anti-inflammatory agents (*NSAIDs*), food
- 7) Recognizing signs of bleeding and procedures to follow in case of bleeding, heavy bruising, upcoming dental work/invasive procedures, upcoming extended travel
- 8) Importance of compliance
- 9) Lab values and follow-up visits

Each patient will receive written educational materials in addition to verbal education. Each patient will receive an anticoagulation dosing sheet with instructions that include AC Clinic contact information (*phone/fax/email/website*), the appropriate dose, strength, target labwork or INR range, INR or other pertinent lab results & follow-up AC Clinic appointment date/time with each visit to AC Clinic. The warfarin dosing sheet will contain the dose corresponding to each day of the week.

As the patient is educated, the AC Clinic pharmacist/physician medical director will document the level of comprehension for the various topics in the AC Clinic patient account EHR.

The MNMC AC Clinic supports and complies with MNMC policies to support guidelines for meeting the learning needs of patients and their families and to provide a mechanism to identify and address community healthcare education needs (*newspaper articles, pamphlets, etc*). Please see the policy: [MNMC Patient Education and Health Literacy I.F.1.01](#).

The MNMC AC Clinic supports and complies with MNMC to effectively communicate with patients when providing care, treatment, and services, and respecting the patient's rights to receive information in their preferred language for healthcare. Therefore, MNMC provides free medical interpreters and certified sign language interpreters proficient in language skills as well as interpreter skills in the targeted language during medical encounters. Staff will document in the EHR the presence of an interpreter for essential healthcare encounters including Assessment, Education, Informed Consents and Discharge Instructions. See policy: [MNMC Interpreter Services #5020](#).

## Section 1.09 QUALITY ASSURANCE

Clinical outcome data including, but not limited to, time in therapeutic range (TTR) as defined by the Rosendaal Equation, hemorrhagic/thromboembolic complications, and resource utilization (*hospital admissions and ED visits*) will be compiled on a continuous basis. Workload, complication data, as well as outcomes tracking for the AC Clinic will be reported to the pharmacy anticoagulation clinical coordinator &/or physician medical director.

#### Section 1.10 BILLING FOR SERVICES PERFORMED IN THE MNMC AC CLINIC

Hospital-based patient billing in the MNMC AC Clinic is done using a point system that has been developed to assess and document the amount of individualized time that is required for the appropriate management of each patient (*CPT4: 99211, 99212, 99213, 99214, 99215*). The point system tool also provides a means by which patients can be identified for chart review by the medical director. In order to ensure consistency in assessment between the pharmacists in the clinic, audits are routinely performed. The MNMC AC Clinic may also utilize telehealth visits.

In addition, each warfarin patient is charged for the prothrombin time (POC) (*CPT4: 85610*) and for the finger stick (*capillary blood draw, CPT4: 36416*).

#### Section 1.11 MEDICAL DIRECTOR REVIEW & RESPONSIBILITIES

The medical director of the AC Clinic has direct medical oversight over the activities of the clinic as outlined in the procedure below:

1. Oversight responsibilities include review of policies and procedures for the MNMC Anticoagulation Clinic:
  - a. Initial review of new policies, procedures, and modifications prior to implementation
  - b. Annual review of policies and procedures in place
2. Serve as a supervising physician:
  - a. Available in person or by phone during routine hours of clinic operation
  - b. Provide consultation on individual patient management during these hours
  - c. Review patient data for patients newly referred into the MNMC anticoagulation clinic; perform 1<sup>st</sup> patient visits and education at which time appropriateness of anticoagulation therapy and choice of anticoagulant is determined
  - d. See clinic patients, when appropriate, based on review of patient data and pharmacist input.
  - e. Provide inpatient consultation, when requested
  - f. Work with the referring physicians and pharmacists to formulate care plans for non-routine therapies for patients in the clinic (*alternative anticoagulant plans*).
  - g. Provide consultation to *pharmacists & providers when requested* regarding anticoagulation, anticoagulation reversal with vitamin K, transfusion of PCCs (*ex: Kcentra/NovoSeven*) and other coagulation factors (*ex: Humate-P/Advate*), as needed.
  - h. Review and close charts of former patients in the clinic
  - i. Periodic review of patient charts according to the following guidelines:
    - i. Review of **ALL** Level III, IV, & V visits
    - ii. Review of the charts of patients who have had a significant event (*thrombosis, bleed, etc.*)
    - iii. Review of the charts of all patients who will be undergoing an invasive procedure &/or when their referring physician has requested consultation. Establishment of **peri-procedural anticoagulation** plans.
    - iv. Review of 5% of all Level I and II visits per week (*random*)
    - v. Review of any patient chart on pharmacists' request
  - j. Development of perioperative plans in collaboration with providers performing procedure & other providers as needed.

#### APPENDICES

1. Sign/symptoms hemorrhage & thromboembolism
2. AC Clinic management of non-therapeutic INRs without significant bleed
3. AC Clinic procedure for oral vitamin-K administration

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### **Signs & Symptoms of Hemorrhage**

- ◆ Severe Epistaxis
- ◆ Hematemesis
- ◆ Hemoptysis
- ◆ Hematuria
- ◆ Melena
- ◆ Hematochezia
- ◆ Vaginal Bleeding
- ◆ Orthostasis
- ◆ Syncope
- ◆ Mental Status Changes
- ◆ Neurologic Changes

### **Signs & Symptoms of Venous Thrombosis**

- ◆ Pain (*localized or diffuse*)
- ◆ Tenderness
- ◆ Swelling/Edema
- ◆ Discoloration

### **Signs & Symptoms of DVT**

- ◆ Discolored Lower Extremity
- ◆ Pain in Lower Extremity
- ◆ Swelling of Lower Extremity

### **Signs & Symptoms of Pulmonary Embolism**

- ◆ Sudden Onset Dyspnea
- ◆ Tachypnea
- ◆ Tachycardia
- ◆ Pleuritic Chest Pain
- ◆ Anxiety
- ◆ Diaphoresis
- ◆ Syncope/Shock
- ◆ Apprehensive Breathing
- ◆ Cough
- ◆ Hemoptysis

### Management of Non-Therapeutic INRs *WITHOUT* Significant Bleed

<p><b>INRs ABOVE therapeutic level but BELOW 5.0</b> (∅ <i>significant bleeding</i>)</p>	<ul style="list-style-type: none"> <li>◆ ↓ dose or omit 1-2 doses; monitor more frequently &amp; resume therapy at a ↓ dose when INR therapeutic.</li> <li>◆ If INR minimally above therapeutic range, no dose reduction may be required.</li> </ul>
<p><b>INRs 5.0 or ABOVE, but BELOW 10**</b> (∅ <i>significant bleeding</i>)</p>	<ul style="list-style-type: none"> <li>◆ Omit next 2-4 doses, monitor INR more frequently, and resume therapy at ↓ dose when INR therapeutic.</li> <li>◆ Alternatively, omit doses and administer oral vitamin K<sub>1</sub> 1-2.5-5 mg if patient at ↑ risk of bleeding.</li> <li>◆ For more rapid reversal (e.g. <i>pt needs urgent invasive procedure</i>), administer oral vitamin K<sub>1</sub> 5mg or less with the expectation that reduction of INR will occur in 24 hours. If INR still high, administer additional dose of oral vitamin K<sub>1</sub> 1.25-2.5mg can be given.</li> </ul>
<p><b>INRs 10** or ABOVE</b> (∅ <i>significant bleeding</i>)</p>	<ul style="list-style-type: none"> <li>◆ Hold warfarin therapy &amp; administer higher dose of oral vitamin K<sub>1</sub> 2.5-10mg with the expectation that INR will substantially ↓ in 24-48 hours.</li> <li>◆ Monitor INR more frequently and administer additional vitamin K<sub>1</sub> if necessary.</li> <li>◆ Resume therapy at lower dose when INR reaches therapeutic level.</li> </ul>

\*\*INR upper reportable limit is >9.7 at MNMC (effective 2020).

#### References

Recommendations from Chest 2012,12;141(2):10S

Recommendations from J Thromb Thrombolysis. 2016;41:187-205.

#### **Guidance Statements**

For non-bleeding patients presenting with an elevated INR we suggest the following:

- INR 4.5 – 10: Withholding warfarin alone or in combination with 1.25–2.5 mg of oral vitamin K
- INR > 10: 2.5 mg of oral vitamin-K

## AC Clinic Procedure for Oral Vitamin K Administration

Patients with an elevated INR & without apparent active bleed may receive oral vitamin K (*prescription strength, nutraceutical grade, or even dietary Vit-K guidance—if unwilling to take pills*) to decrease the INR and lower the risk of bleeding. The AC Clinic physician medical director or referring provider will provide approval prior to administration of ANY oral vitamin K. By administering oral vitamin K in the clinic, the INR will fall into a safer range in approximately 24 hours. The administration of oral vitamin K for suprathereapeutic INRs in the AC Clinic setting aims to decrease emergency department visits, **provided there is no apparent active bleeding.** In addition, oral vitamin K does not completely reverse warfarin and therefore; aims to minimize warfarin resistance upon resumption of warfarin therapy. Individual cases of patient's with signs &/or symptoms of active bleeding &/or are not candidates for oral vitamin K, are reviewed with the AC Clinic physician medical director or referring provider and may be referred to the emergency department.

- ◆ The AC Clinic physician medical director, will be immediately notified by an AC Clinic pharmacist if the patient encounter warrants alternative management to holding warfarin dose(s) or if the INR is 5 or above.
- ◆ A patient having an INR above 5 (*and below 10 without signs &/or symptoms of bleeding*) is a potential candidate for oral vitamin K administration. However, each patient will be individually evaluated based not only on the patient's INR results; but also the patient interview, change in patient medical conditions, whether a new health problem or a change in an existing condition, alterations in diet or alcohol intake, change in &/or addition to medication therapy, whether prescription or non-prescription/herbal therapy, and compliance/non-compliance with current therapy.
- ◆ The single dose of oral vitamin K will be administered to the patient while in AC Clinic and documentation of administration will exist in the patient's EHR.
- ◆ The patient will return to the AC Clinic in a timely manner for a re-check of the INR or as otherwise instructed by the AC Clinic physician medical director.

\*\* See Appendix 2: *Management of Nontherapeutic INRs*

Signed by:

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Pharmacy Manager

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