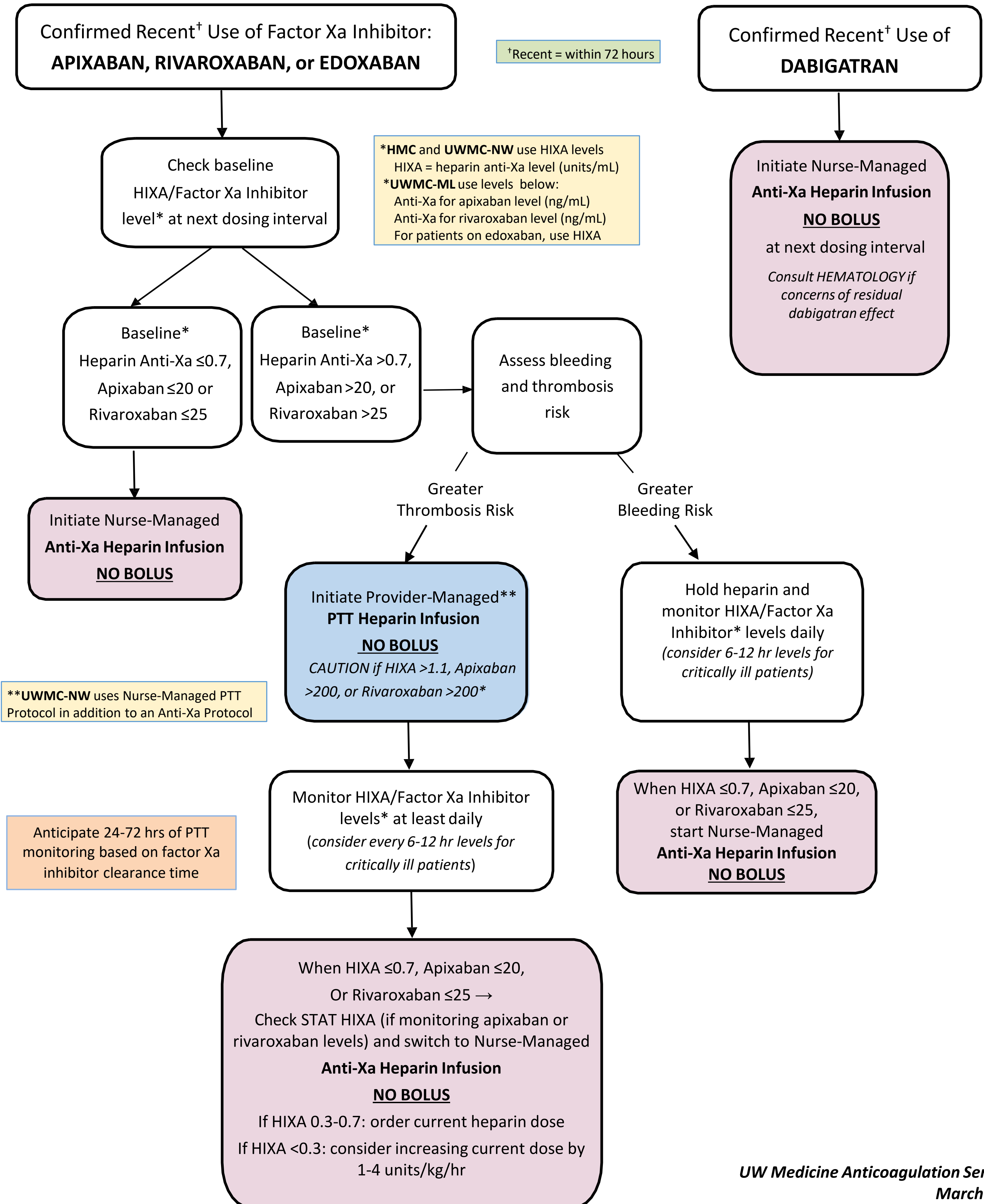
UW Medicine

RECOMMENDATIONS FOR DOAC TO INTRAVENOUS HEPARIN TRANSITION

This algorithm is intended as a general guideline, not a protocol, for transitioning patients taking DOACs (direct oral anticoagulants) to IV heparin. These recommendations should not replace clinical judgement along with individual assessments of bleeding/thrombotic risks. *SEE PAGES 2-3 FOR FULL GUIDELINES.*



UW Medicine Anticoagulation Services
March 2022

Disclaimer: This document and its recommendations are only intended as a guideline and should not replace clinical judgment along with individual patient assessments of bleeding and thrombotic risks.

1. **DETERMINE Anticoagulant Use History**
   a. Patients with confirmed recent (within 72 hours) use of **dabigatran** (direct thrombin inhibitor) should be initiated on the Nurse-Managed **Anti-Xa Heparin Infusion (no boluses)**
      i. Consult Hematology if concern for residual dabigatran effect, e.g., patients with acute renal failure
      ii. If needed, presence of dabigatran effects may be detected with a rapid direct oral anticoagulant (DOAC) screen
   b. Patients taking **apixaban** or **rivaroxaban** should be ordered a factor Xa inhibitor specific level or heparin anti-Xa level (HIXA) at the time of the next dosing interval and at least daily thereafter (consider every 6-12 hour levels for critically ill patients)
      i. **UWMC-ML uses factor Xa inhibitor-specific levels; HMC and UWMC-NW use heparin anti-Xa levels**
      ii. Patients previously on apixaban, order levels 12 hours after the last dose and at least daily thereafter
      iii. Patients previously on rivaroxaban, order levels 24 hours after the last dose and at least daily thereafter
   c. Patients taking **edoxaban** should be ordered a heparin anti-Xa level 24 hours after last dose and at least daily thereafter
      i. Edoxaban specific level not yet available
   d. Patients taking **prophylactic doses** of an oral factor Xa inhibitor or if significant time has passed since the last therapeutic dose, consider checking a baseline heparin anti-Xa level first prior to initiating heparin
      i. If heparin anti-Xa <0.1 units/mL, use the Nurse-Managed **Anti-Xa Heparin Infusion** based on indication

2. **CHOOSE Which Heparin Protocol to Initiate**
   a. General notes:
      i. Heparin should be initiated no earlier than at the time of the next dosing interval of the factor Xa inhibitor
      ii. An exception may be in cases of oral factor Xa inhibitor treatment failure, i.e., new, objectively confirmed venous thromboembolism where heparin may need to be started without delay and regardless of the last factor Xa inhibitor dose
      iii. May consider delaying heparin initiation if the apixaban or rivaroxaban levels are elevated, e.g., >200 ng/mL or if heparin anti-Xa >1.1 units/mL* in order to avoid duplicate anticoagulant therapy
         1. Note: there may be instances where heparin is indicated irrespective of the drug level
   b. If baseline heparin anti-Xa ≤0.7 units/mL*, apixaban ≤20 ng/mL, or rivaroxaban ≤25 ng/mL, initiate Nurse-Managed **Anti-Xa Heparin Infusion (no boluses)**
   c. If baseline heparin anti-Xa >0.7 units/mL*, apixaban >20 ng/mL, or rivaroxaban >25 ng/mL evaluate bleeding vs. thrombosis risk
      i. If greater bleeding risk, hold heparin & monitor daily levels (consider every 6-12 hr levels for critically ill pts.)
         1. When heparin anti-Xa ≤0.7 units/mL*, apixaban ≤20 ng/mL, or rivaroxaban ≤25 ng/mL, initiate Nurse-Managed **Anti-Xa Heparin Infusion (no boluses)**
      ii. If greater thrombosis risk, initiate Provider-Managed **PTT Heparin Infusion**
         1. This is **NOT** a nurse managed protocol at UWMC-ML or HMC; however, UWMC-NW has a nurse managed PTT protocol.

3. **USING the Provider-Managed PTT Heparin Infusion**
   a. **Initiation:**
      i. Provider-Managed **PTT Heparin Infusion** includes a STAT baseline PTT
         1. Do not wait for results of the baseline PTT prior to initiating heparin unless suspicion for factor Xa inhibit or toxicity (e.g., in the setting of overdose, acute renal failure, acute liver failure) or if the patient has an unusually high risk of bleeding
         2. If baseline PTT is elevated, it may indicate the presence of underlying coagulopathy or excessive factor Xa inhibitor effects, recommend consulting Hematology in these situations
   b. Ordering:
      i. Order Provider-Managed **PTT Heparin Infusion**
         1. Do not order an initial heparin bolus
         2. Specify initial heparin rate
            a. Acute thrombosis: 18 units/kg/hr
            b. Atrial fibrillation, valve replacement, or bridging: 15 units/kg/hr
            c. Mechanical circulatory support: 15 units/kg/hr
               i. Concurrent Impella heparin purge solution: 5 units/kg/hr
            d. Acute coronary syndrome or acute ischemic stroke: 12 units/kg/hr

3. Specify PTT goal
    a. Regular intensity: 60-100 seconds
    b. Low intensity: 60-80 seconds

c. **Adjusting:**
- i. Providers are responsible for making dose adjustments
    1. It is recommended to monitor Factor Xa inhibitor/heparin anti-Xa* levels at least daily
        a. Anticipate 24-72 hours of PTT monitoring based on DOAC clearance time
        b. **Note:** May consider every 6-12 hour levels for critically ill patients
- ii. Algorithm available on UW Medicine Anticoagulation Services Website → Monitoring Heparin With PTT Levels

d. **Switching to Nurse-Managed Anti-Xa Monitored Heparin Protocol:**
- i. Patients should be switched to the Nurse-Managed **Anti-Xa Heparin Infusion** based on indication when the apixaban or rivaroxaban level is near undetectable (<20 ng/mL or <25 ng/mL, respectively) or when heparin anti-Xa level <0.7 units/mL* for patients previously taking edoxaban
    1. Algorithm available on UW Medicine Anticoagulation Services Website → Heparin Infusion Algorithms
- ii. Check STAT heparin anti-Xa level (add-on laboratory test if a PTT was drawn within the last 6 hours)
- iii. Specify initial heparin dose in the new order
    1. If the heparin anti-Xa level is within 0.3-0.7 units/mL: order current heparin dose
    2. If the heparin anti-Xa level is <0.3 units/mL: consider increasing current heparin dose by 1-4 units/kg/hr
    3. Note: **No bolus is required**

* UWMC-ML uses factor Xa inhibitor-specific levels; HMC and UWMC-NW use heparin anti-Xa levels

Abbreviation: DOAC = Direct Oral Anticoagulant. HIXA = UW Medicine lab code for heparin infusion anti-Xa, also known as heparin-calibrated anti-Xa or anti-Xa for heparin. PTT = Partial Thromboplastin Time.