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.*

Confirmed Recent† Use of Factor Xa Inhibitor:
APIXABAN, RIVAROXABAN, or EDOXABAN

†Recent = within 72 hours

Confirmed Recent† Use of
DABIGATRAN

Initiate Nurse-Managed
Anti-Xa Heparin Infusion
NO BOLUS
at next dosing interval

Consult HEMATOLOGY if concerns of residual dabigatran effect

Check baseline
Heparin Anti-Xa/Factor Xa Inhibitor level* at next dosing interval≠

≠***Heparin initiation does not need to be postponed until baseline level results***
*__HMC__ and __UWMC-NW__ use heparin anti-Xa levels
Heparin anti-Xa level = HIXA (units/mL)
*__UWMC-ML__ use levels below:
Anti-Xa for apixaban level (ng/mL)
Anti-Xa for rivaroxaban level (ng/mL)
For edoxaban, use heparin anti-Xa level

Assess bleeding and thrombosis risk

Greater Bleeding Risk

Delay heparin and monitor Heparin Anti-Xa /Factor Xa Inhibitor* levels daily

When Heparin Anti-Xa ≤0.7, Apixaban ≤50, or Rivaroxaban ≤50, start Nurse-Managed
Anti-Xa Heparin Infusion
NO BOLUS

Greater Thrombosis Risk

Initiate Provider-Managed**
PTT Heparin Infusion
NO BOLUS

**__UWMC-NW__ uses Nurse-Managed PTT Protocol in addition to an Anti-Xa Protocol

Assess baseline Heparin Anti-Xa /Factor Xa Inhibitor level, and continue PTT Heparin Protocol if within acceptable range

If baseline Heparin Anti-Xa >1.1, Apixaban >200, or Rivaroxaban >200 → Consider holding heparin until levels are below these values

If baseline Heparin Anti-Xa ≤0.7, Apixaban ≤50 or Rivaroxaban ≤50 → Switch to Nurse-Managed
Anti-Xa Heparin Infusion
NO BOLUS

Monitor Heparin Anti-Xa/Factor Xa Inhibitor levels* daily

Anticipate 48-72 hrs of PTT monitoring based on factor Xa inhibitor clearance time

When Heparin Anti-Xa ≤0.7, Apixaban ≤50, or Rivaroxaban ≤50 →
Check STAT Heparin Anti-Xa (if monitoring apixaban or rivaroxaban levels) and switch to Nurse-Managed
Anti-Xa Heparin Infusion
NO BOLUS
If Heparin Anti-Xa 0.3-0.7: order current heparin dose
If Heparin Anti-Xa <0.3: consider increasing current dose by 1-4 units/kg/hr

UW Medicine Anticoagulation Services
October 2023

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 and CHECK Baseline Level**
    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)** at the time of the next dosing interval
        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 for a baseline factor Xa inhibitor specific level or heparin anti-Xa level (HIXA)
        i. **UWMC-ML uses factor Xa inhibitor-specific levels; HMC and UWMC-NW use heparin anti-Xa levels**
        ii. Patients previously on apixaban: baseline level should be obtained at least 12 hours after the last dose
        iii. Patients previously on rivaroxaban: baseline level should be obtained at least 24 hours after the last dose
    c. Patients taking **edoxaban** should be ordered for a baseline heparin anti-Xa level at least 24 hours after last dose
        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

2. **ASSESS Bleeding and Thrombosis Risk**
    a. If greater bleeding risk, delay heparin initiation & monitor daily factor Xa inhibitor or heparin anti-Xa levels
        i. When heparin anti-Xa ≤0.7 units/mL, apixaban ≤50 ng/mL, or rivaroxaban ≤50 ng/mL, initiate Nurse-Managed **Anti-Xa Heparin Infusion (no boluses)**
    b. If greater thrombosis risk, initiate Provider-Managed **PTT Heparin Infusion**
        i. This is **NOT** a nurse managed protocol at UWMC-ML or HMC; however, UWMC-NW has a nurse managed PTT protocol.
        ii. Do not wait for results of baseline factor Xa inhibitor or heparin anti-Xa level prior to initiating heparin
        iii. Assess the baseline level when it results
            1. If baseline heparin anti-Xa >1.1 units/mL, apixaban >200 ng/mL, or rivaroxaban >200 ng/mL, consider holding heparin until levels are below these values in order to avoid duplicate anticoagulant therapy
            2. If baseline heparin anti-Xa ≤0.7 units/mL, apixaban ≤50 ng/mL, or rivaroxaban ≤50 ng/mL, switch to Nurse-Managed **Anti-Xa Heparin Infusion (no boluses)**
            3. If baseline heparin anti-Xa or factor Xa inhibitor levels are within acceptable range (e.g., heparin anti-Xa between 0.7 and 1.1 units/mL), continue with Provider-Managed PTT Heparin Infusion while monitoring levels daily
    c. General notes:
        i. Heparin initiation:
            1. Should generally occur no earlier than at the time of the next dosing interval of the factor Xa inhibitor
            2. Does NOT need to be postponed until results of baseline anti-Xa level have returned.
            3. May need to be delayed if suspicion for factor Xa inhibitor 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
            4. May be indicated irrespective of the drug level or time of last oral factor Xa dose (e.g., in cases of oral factor Xa inhibitor treatment failure with a new, objectively confirmed venous thromboembolism)

3. **USING the Provider-Managed PTT Heparin Infusion (UWMC-NW uses Nurse-Managed PTT Protocol)**
    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 inhibitor 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
         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 (or nurses at UWMC-NW) are responsible for making dose adjustments based on PTT results; algorithm available on UW Medicine Anticoagulation Services Website → Heparin Infusion PTT Algorithm
      1. Based on DOAC clearance time, anticipate 24-72 hours of PTT monitoring before factor Xa inhibitor/heparin anti-Xa levels are low enough to switch to Anti-Xa Monitored Heparin Protocol
      2. Monitor factor Xa inhibitor/heparin anti-Xa levels at least daily to determine when to switch

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 ≤50 ng/mL, or when heparin anti-Xa level is ≤0.7 units/mL
   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**

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.