



Lab Alert: Anticoagulation Therapy and Therapeutic Drug Monitoring

Purpose: To further the understanding of the role of Coagulation Laboratory and familiarize staff with current clinical policies/ guidelines.

UIHSS Policies regarding anticoagulant therapy, including dosing nomograms, and drug monitoring:

Clinical Care Protocols: <http://intranet.uimcc.uic.edu/SitePages/ClinicalCareProtocols.aspx>

- (No:P-13.04), Intravenous Heparin Infusion in the Adult Population

Clinical Care Guidelines: <http://intranet.uimcc.uic.edu/SitePages/ClinicalCareGuidelines.aspx>

- Medication Use
 - G-13.23 Warfarin Use in Adults
 - G-13.31 Enoxaparin Use
 - G-1.03 VTE Deep Vein Thrombosis Prophylaxis
 - G-13.09 HIT and Dosing/Management of Alternative Anticoagulants

Coagulation Laboratory and Heparin Testing:

Unfractionated Heparin (UFH): In patients on heparin there are multiple factors (i.e., coagulation factor deficiencies, factor inhibitors) that may additionally influence the aPTT results. With the current reagent the relationship of the aPTT to ex vivo unfractionated heparin concentration of 0.3 U/ml to 0.7U/ml is approximately 60-100 seconds; however it is strongly recommended that the heparin concentration using **Heparin Assay (Anti-Factor Xa assay)** be utilized for monitoring.

Low-Molecular-Weight-Heparin(LMWH): When a weight based dose of the drug is used, many patients will not require monitoring, however there are circumstances (e.g., extreme of body weight, pediatric patients, reduced renal function) when confirmation of the drug concentration is indicated. Refer to Anti-Factor Xa and sample dosing nomograms per Critical Care Guideline G-13.31.

Heparin Induced Thrombocytopenia and Thrombosis (HIT):

Patients who are exposed to UFH or LMWH are at risk for the development of HIT. Refer to Critical Care Guideline G-13.09.

Coagulation Laboratory performs testing for “HIT antibody” (PF4-dependent immunoassay) which has very high sensitivity in the high probability (high “4T” score) HIT cases. In the equivocal cases confirmatory assay can be performed (“Serotonin Release Assay”, which is a send out test).



- Serotonin Release Assay (SRA) is very specific but will take several days for results.
- Due to turn-around-time of results clinicians are reminded to check for the SRA results after ordering it, and to update allergy information in PowerChart accordingly.

Monitoring of Direct Xa Inhibitors (i.e., Rivaroxaban, Apixaban):

Our vendor's calibrators for measurement of *Rivaroxaban* by Anti-Factor Xa chromogenic assay are currently for research use only and are not being used by the UIC Coagulation Laboratory. Therefore STAT ordering to precisely determine plasma concentration of these drugs is not available since (in the interim) this would be a send-out test.

- If the Anti-Factor Xa assay had been performed in house on patients receiving Rivaroxaban, ordering services should be aware of this limitation.
- Prothrombin time (PT/INR) is not suitable for measuring rivaroxaban (*Thrombosis Journal 2013,11:11*).
For Apixaban: Our Laboratory is in the process of development of Apixaban Anti-Factor Xa, and a separate Lab Alert will be distributed once this test is available in house.

Direct Thrombin Inhibitors (i.e. Argatroban):

Manufacturers recommend the use of the aPTT to monitor the use of DTIs. In general, the recommendations are to target the aPTT to 1.5 to 2.5 times the baseline of the reference range. Refer to the dosing protocol from Addendum A and Addendum B of the Clinical Care Guidelines (G-13.09).

For any questions please contact Vladimir Vidanovic, MD, Interim Director of Clinical Pathology and Director of Special Coagulation Laboratory at 6-1075.