Current Status: *Active* **PolicyStat ID:** *9689681*

Origination:	*6/24/2021*
Effective:	*6/24/2021*
Last Approved:	*6/24/2021*
Last Revised:	*6/24/2021*
Next Review:	*6/24/2023*
Document Contact:	*Tamara Sabih: Medical Technologist Lead*
Area:	*Laboratory-Hematology*
Key Words:	
Applicability:	*All Beaumont Hospitals*

Coagulation New Reagent Lot Number Rollover

Document Type: Procedure

I. PURPOSE AND OBJECTIVE:

Currently all 8 hospitals are on the same instrument platform (ACL TOP) and they all have transitioned to the same lot number of Prothrombin (PT) and Activated Partial Thromboplastin Time (APTT). This procedure will establish the protocol utilizing five representative hospitals (RYO, TRY, FMH, WYN, and DBN) to standardize new reagent lot rollover.

II. ACRONYMS:

A. Abnormal Control 3 (ABN 3)
B. Activated Partial Thromboplastin Time (aPTT)
C. Cumulative Summation (CUM)
D. D-Dimer HS 500 (DDHS)
E. Disseminated Intravascular Coagulation (DIC)
F. Dilute Russell's viper venom time confirm (dRVVT C)
G. Dilute Russell's viper venom time screen (dRVVT S)
H. Fibrinogen QFA (QFA)
I. Information Technology (IT)
J. International Normalized Ratio (INR)
K. International Sensitivity Index (ISI)
L. Laboratory Information System (LIS)
M. Laboratory Test Directory (LTD)
N. Low Fibrinogen Control (Low Fib)
O. Normal Control 1 (Normal 1)
P. Prothrombin Time (PT)
Q. Royal Oak (RYO)
R. Troy (TRY)
S. Farmington Hills (FMH)

T. Wayne (WYN)

U. Dearborn (DBN)

III. ESTABLISH A HEPARIN THERAPEUTIC RANGE:

A. **For RYO Only:**

1. Obtain 2 lot numbers of aPTT reagents and perform cumulative sum study (see step 2-4) and select the preferable lot number to send to each of the five representative hospitals.
2. One cum sum document will be prepared to send to all hospitals. The frozen samples will be used for Ex-vivo studies if the cum sum study fails or is deemed inadequate.
3. Plot the comparison data with the current lot of aPTT reagent on the x-axis and the new lot aPTT reagent on the y-axis.
4. Determine the mean and standard deviation for the current and new aPTT reagent lot.
5. The difference of the means and standard deviations are recorded for future reference.
6. Prepare a cumulative summation of differences.
   NOTE: See CAP Survey 2007 CG2 Participant Summary.
7. Within one month run the anti-Xa test on the frozen samples (if needed).

B. **For 5 hospitals (RYO, TRY, FMH, WYN, and DBN):**

1. **Please review the screening criteria for Heparin patients-each site:**
   a. On continuous infusion unfractionated heparin.
   b. INR <1.3.
   c. Only received one time dose of warfarin.
   d. Not receiving anticoagulant in past 48 hours.
   e. Not receiving concomitant hormone therapy and not pregnant.
2. From the list of patients obtained daily from the pharmacy, run a PT and aPTT on 15-20 patients at each of the five representative hospitals using the current lot of PT/aPTT reagent and new lot number of aPTT reagent.
3. Save plasma on 10-15 heparin patients after ordered test is completed and print patient's result ***(preferably within one hour or ASAP)***
4. Make sure to double spin the specimen before aliquoting.
5. Do not save hemolyzed samples.
6. **Please use only the approved aliquot tubes (Screw cap tube, 5 ml, 75 x 13 mm, round base, polypropylene).**
7. Place samples in the -70 freezer to send to RYO.

IV. ISI (ALL SITES):

A. Enter the ISI value provided on the package insert of the RP2G from the Material List window.

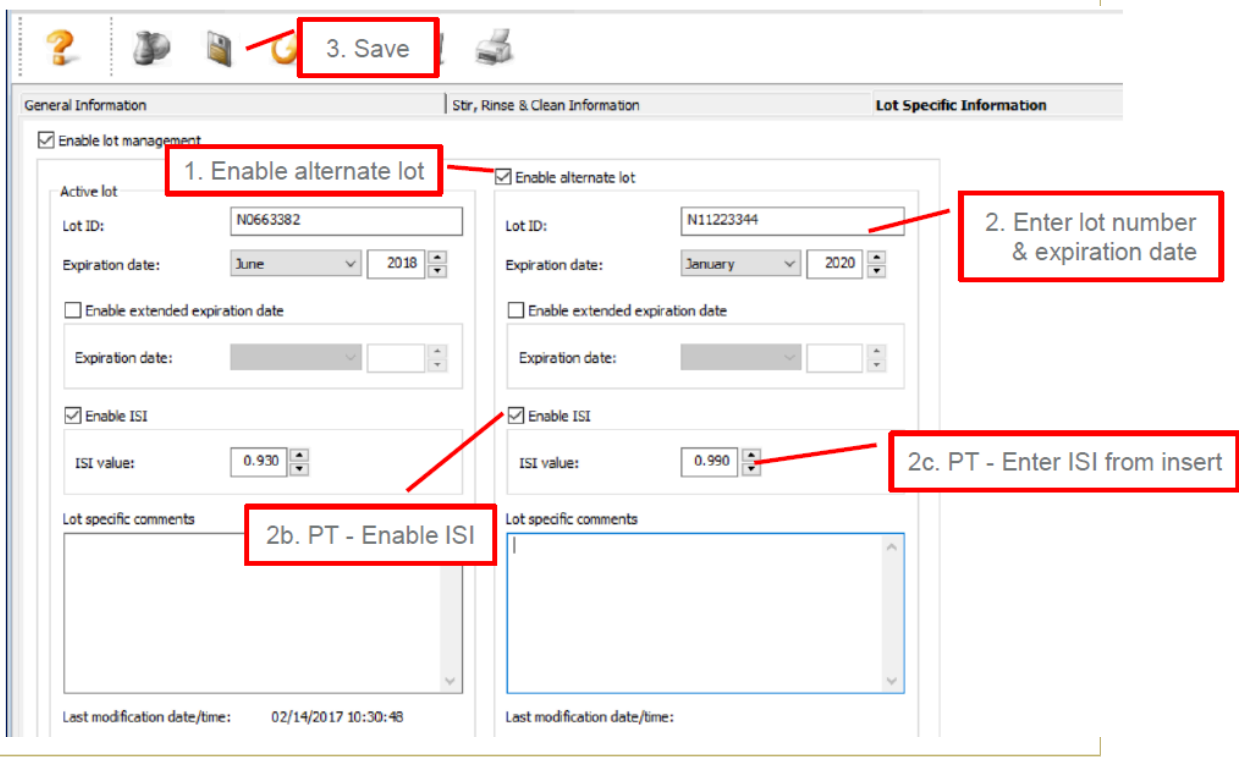
B. The ISI is specific to each lot number and describes the sensitivity of the reagent and along with the geometric mean is used to calculate the INR.

C. It is imperative to enter the geometric mean (established from the normal patient population studies and specific to each ACL TOPS) when the new lot is activated.

V. PROCEDURE:

A. **All Sites:**

1. **Program a new lot number of reagents, controls, and calibrators:** Program all ACL TOP analyzers for new lots of reagents, controls, and calibrators.
   a. Enter in new lot numbers of APTT, PT, QFA, and DDHS.
   b. Enter in new lot numbers of Normal 1, ABN 3, Low Fib, and DDHS controls level 1 and 2.
   c. Enter in new lot numbers of DDHS calibrator and Calibrator Plasma.
      i. Choose **Setup, Materials List.**
      ii. Choose the **Lot Specific Information tab** and then **Enable Lot Management** select **Alternate Lot** button.
      iii. Enter the lot number and expiration date for each reagent and control and select the **Save** icon to store the information.
      iv. Enter the control ranges established by IL and reflected on the package insert for each quality control (QC) material
      while gathering data to determine your site specific QC ranges
      v. Enter DDHS calibrator and Calibrator Plasma lot numbers and expiration dates.
      vi. Select the **Save** icon to store the information. Once the lot number is saved, the **Assigned Values** icon becomes available to enter the calibrator target value.
      vii. Enter the calibrator value from Calibrator Plasma and DDHS, Choose **OK.**
      viii. Choose the **Previous Screen** icon to exit.



2. **Prepare Standard Curve:** Always start with **fresh Factor Diluent**, verify all maintenance pertaining to probes and syringes is up to date, and perform the Enhance Clean for all Probes **with fresh Clean B** prior to calibration.
    a. **Prepare a standard curve for the new lot of QFA:**
        i. Load the QFA Thrombin, Calibration Plasma, Diluted Clean B and Factor Diluent onto the ACL TOP.
        ii. Select **Calibration, Status List**.
        iii. Double-click on the QFA Thrombin test code to open the **Calibration Details** screen.
        iv. Choose the **Run** icon.
        v. Select **OK** at the “Do you confirm the operation?” prompt.
        vi. Choose the **Previous Screen** icon to return to the **Calibration Status List.**
        vii. Verify the Job Status for the QFA and QFA low test code says **Active**.
    b. **Prepare a standard curve for the new lot of DDHS.**
        i. Load the DDHS Latex, DDHS Buffer, DDHS Calibrator and Factor Diluent onto the ACL TOP.
        ii. Select **Calibration, Status List.**
        iii. Double-click on the DDHS test to open the **Calibration Details** screen.
        iv. Choose the **Run** icon.
        v. Select **OK** at the “Do you confirm the operation?” prompt
        vi. Choose the **Previous Screen** icon to return to the **Calibration Status List**.
        vii. Verify the Job Status for the DDHS test code says **Active**.
3. **Reviewing the Calibration:**
    a. Once the calibration is complete, review the calibration results. The calibration must be validated prior to usage for calculating results.
        i. Verify the **Calibration Status List** is displayed or choose **Menu Bar, Calibration, Status List**.
        ii. Double click on the DDHS/ QFA and QFA low test code to open the Calibration Details.
        iii. Choose the **Calibration Information** tab to verify that no errors or warnings occurred during the calibration. Errors will be posted within the Calibration Information tab.
        iv. If the calibration is acceptable, choose the Validate icon to validate the calibration curve. The lettering of the calibration tab will change to blue.
    b. **Troubleshooting failed calibrations:**
        i. If any Data Reduction (DR) rules fail the calibration will also fail and "Failed" will be posted in the Job.
        ii. Using the calibration curve tab review the data for outliers by checking the CV and replicate values. Omit a random outlier if needed.
        Note: If more than one replicate is an outlier, you may have a precision issue. If this happens, start with steps c & d below and then recalibrate.
        iii. Always start with fresh Factor diluent.
        iv. Verify all maintenance pertaining to probes and syringes is up to date. Consider performing the Enhanced Clean for All Probes with fresh Clean B prior to calibrating.

4. **Establish New Control Ranges**:
    a. Using the new lot number of reagents, run the new lot numbers of controls for a period of several days utilizing several operators.
        i. For the PT, APTT, and DDHS: Run 20 points for the new controls level on each IL ACL TOP(s) analyzers.
        ii. For QFA: Run 20 points for level 1 and Low Fib on all core lab routine coagulation analyzers.
        iii. For Thrombin Time: Run 20 points for the new control level 1 and low abnormal assay on all core lab routine coagulation analyzers. **(RYO Only)**
    b. At least 20 data points must be run before establishing a new control range. Once 20 points have been run the new quality contorl (QC) range can be established utilizing the data obtained.
        i. To determine the mean and SD for each specific QC filter the data to include all the points and select the target icon from the tool bar to set the mean and SD
5. **Perform Patient Correlation Studies: Use the reference (primary) analyser:**
    a. **PT and aPTT (All Sites)**:
        i. Run a minimum of 20 patient correlations. Run 10 normal patients and 10 abnormal patients using both the current and new lot of reagents.
    b. **QFA (All Sites):**
        i. Run a minimum of 10 patient correlations. Run 5 normal patients and 5 abnormal patients using both the current and new lot of fibrinogen reagent.
    c. **Thrombin Time: (RYO Only):**
        i. Run a minimum of 10 patient correlations. Use 5 normal patients and 5 abnormal patients using the current and new lot of reagents.
    d. **DDHS(All Sites):**
        i. Run a minimum of 10 patient correlations. Use 5 normal patients and 5 abnormal patients using the current and new lot of reagents.
6. **Verify Reference Ranges (RYO, TRY, FMH, WYN and DBN):**
    a. Verify reference ranges for the PT, aPTT, QFA. Draw at least 20 normal donor with a mixture of females and males.
    NOTE: PATIENTS MUST NOT BE USED FOR THE STUDY ONLY NORMAL DONORS.
    b. Run the normal donors on the primary analyzer for the current and the new lot of reagents, and run the normal donors on the rest of analyzers and alternate methods if available only for the new lot of reagents.
    c. Verify that the blood donors fill out a form listing the medications taken in the last 7 to 10 days.
    d. Combine (RYO, TRY, FMH, WYN, and DBN) data for reference ranges.
    e. Protime geometric mean is to be calculated for each ACL analyzer at each site

B. **(RYO Only):**

1. **Perform Factor Sensitivities:**
    a. Load the precision biologic in a 2 mL cup in the sample rack, and load the factor deficient in the diluent rack D1 or D2 and assign it as Factor Sensitivity Diluent.
    b. Enter the Precision Biologic cryocheck factor level reference value % Test Detail in Calibration for

each factor.

c. Select Calibration, Status List.

d. Double-click on the **INFacSen/ExFacSen** test code to open the Calibration details screen.

e. Choose the **Run** icon

f. Select **OK** at the “Do you confirm the operation?” prompt.

g. Choose the Previous Screen icon to return to the Calibration Status List.

2. **Start4 Analyzer:**

a. Prepare a standard curve for the new QFA reagent. Refer to STart4 Quantitative Fibrinogen procedure.

b. Run new controls over a period of several days utilizing several operators. Run 20 data points for each level of QC Normal1, ABN 3 for the PT and PTT tests.

c. Run 20 data points Normal 1, and Low Fib for QFA test.

d. Run 20 normal donors for the PT test to establish the geometric mean.

VI. NEW LOT OF dRVVT SCREEN AND dRVVT CONFIRM - RYO ONLY:

A. For each new lot of dRVVT S and C, normal ranges should be determined; collect 20 normal donor samples.

B. Determine the mean of each normal range in seconds.

C. The mean of each normal range will be used as constant denominator in the calculations of ratio.

1. **dRVVT Screen:**

a. The patient sample result in seconds is divided by the Mean of the dRVVT S normal range

dRVVT Screen Ratio= Patient dRVVT Screen results (in seconds)
Mean of dRVVT Screen normal Range (in seconds)

2. **dRVVT Confirm:**

a. The patient sample result in seconds is divided by the mean of the dRVVT C normal range

dRVVT Confrim Ratio= Patient dRVVT Confirm results (in seconds)
Mean of dRVVT Confirm Normal Range (in seconds)

3. **Normalized dRVVT Ratio:** The ratio results from the dRVVT S is divided by the ratio result from dRVVT C.

a. **Normalized dRVVT Ratio= dRVVT Screen Ratio**
dRVVT Confirm Ratio

VII. BEFORE GO-LIVE DATE:

A. **LIS:**

1. Submit an Information Technology (IT) ticket to update reference ranges for the PT, aPTT, QFA, inhibitor screen, DIC screen, and Thrombin time (if needed).

2. Submit an IT ticket to update the Heparin Therapeutic Range (if needed).

3. Submit an IT ticket to update the dRVVT reference ranges (if needed).

B. **LTD**:

1. Update LTD and procedures.

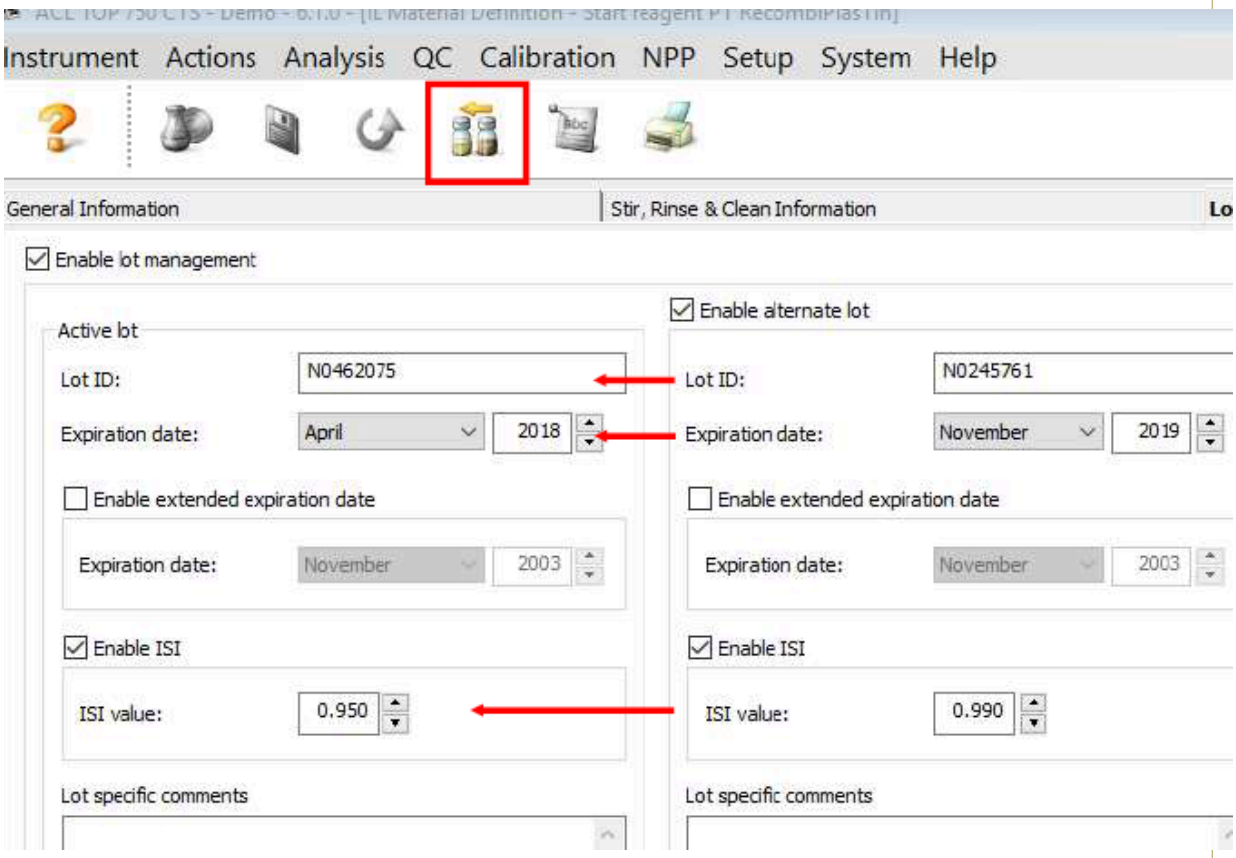
C. **Prepare a " Laboratory Bulletin"**

VIII. ROLLOVER DAY:

Print all alternate QC files prior to Activating any Alternate Lots as the data will be gone and irretrievable once activation occurs.

A. **Activate Alternate Lot (All Sites):**

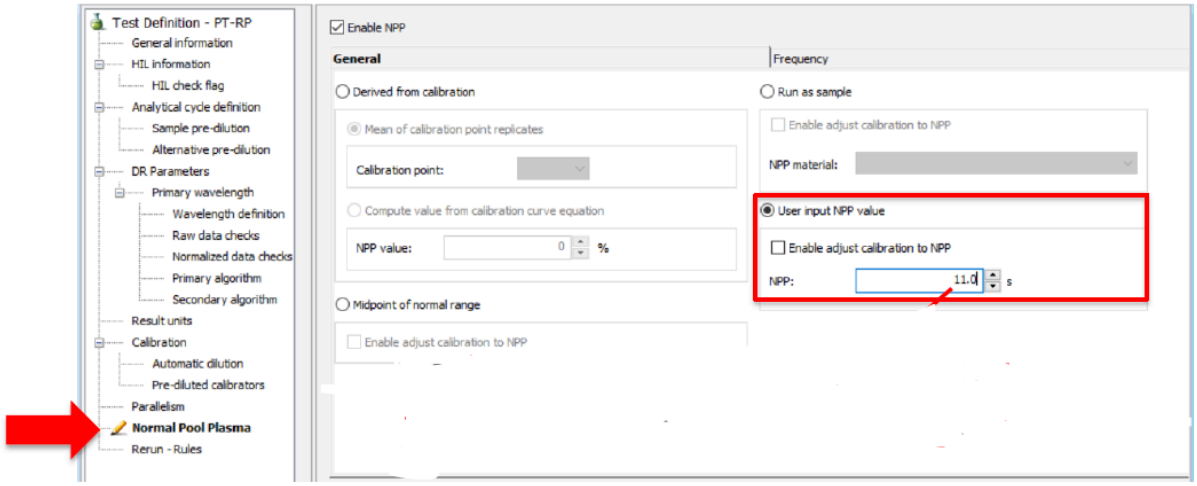
1. Choose **Setup, Material List**, double click on each reagent and control material .
2. Choose **Activate** and **Save**



3. **Update reflex list for dRVVT Screen if needed- (RYO ONLY)**

B. **Enter Geometric Mean (All Sites) :**

1. Choose **Setup, Test List,** double click on PT test, and choose **Normal Pool Plasma** value.
2. Choose **Setup, Test List,** double click on dRVVT S/C test, and choose **Normal Pool Plasma** value to change the mean for both dRVVT S and dRVVT C **(RYO ONLY).**



C. **Start4 Analyzer (RYO Only):**

1. Post the new QC ranges.
2. Program the STart4 with the new fibrinogen reagent lot numbers and calibration. Refer to the Fibrinogen STart4 procedure for information on how to enter the new reagent lot numbers and calibration.
3. Enter the PT reagent lot numbers, geometric mean and ISI value. Verify that there is a witness present.
   a. Enter PT reagent lot numbers, geometric mean, and ISI value.
   b. Select calibration by pressing the [2} key and confirm with [ENT].
   c. Next select others by pressing the [8] key and confirm with [Ent].
   d. Select Mode 1 by pressing the [1] key.
   e. Press any key.
   f. In the next display enter the reagent lot number confirm with [ENT].
   g. The Next display asks for Reference times as T1 and T2.
   h. Enter the geometric mean for T1 and T2 and confirm with the [ENT].
4. Enter the ISI value from the Main Menu.
   a. Select Test Parameters by pressing the [3] key and confirm with [ENT].
   b. Select others by pressing the [8] key and confirm with the [ENT].
   c. Select Mode 1 by pressing the [1] key.
   d. Press the enter key until the cursor is under the Select the Unit.
   e. Select the Unit Sec-INR by pressing the [3] key and validate with the [ENT].
   f. Enter the ISI value of the RecombiPlatin 2G reagent lot number.
5. Run test patients and check the PT INR calculations.

D. On the New Lot# of RecombiPlastin 2G Witness Form, document the change of the protime normal mean and ISI value **(All Sites)**
(see an example in **Attachment A).**

Attachments

Attachment A- New Lof Of RecombiPlastin 2G.pdf

Approval Signatures

Step Description	Approver	Date
	Ann Marie Blenc: System Med Dir, Hematopath	6/24/2021
Coagulation Medical Director Designee	Marc Smith: System Med Dir, Coagulation	6/4/2021
Policy and Forms Steering Committee Approval (if needed)	Tamara Sabih: Medical Technologist Lead	5/27/2021
Policy and Forms Steering Committee Approval (if needed)	Gail Juleff: Project Mgr Policy	5/27/2021
System Operations Director	Brittnie Berger: Dir, Lab Operations C [SB]	5/26/2021
System Manager	Rebecca Bacarella: Mgr Laboratory	5/26/2021
	Tamara Sabih: Medical Technologist Lead	5/14/2021

Applicability

Dearborn, Farmington Hills, Grosse Pointe, Royal Oak, Taylor, Trenton, Troy, Wayne