PLASMA REPLACEMENT

☒ St. Joseph Medical Center Tacoma, WA ☒ St. Clare Hospital Lakewood, WA ☒ St. Elizabeth Hospital Enumclaw, WA
☒ St. Francis Hospital Federal Way, WA ☒ St. Anthony Hospital Gig Harbor, WA ☐ Highline Medical Center Burien, WA ☒ PSC

PURPOSE

To provide instructions for managing CBC specimens with marked lipemia or interference from cryoglobulins or cold auto-antibodies.

BACKGROUND

Lipemic plasma may cause turbidity within the hemoglobin chamber and / or incomplete red cell lysis. This may result in a falsely elevated HGB result and invalid RBC indices. Plasma replacement may also be performed for specimens with strong cold agglutinins.

RELATED DOCUMENTS

R-W-HEM-1413	RBC Agglutination Management
M-W-HEM-1578	CBC Table of Interferences
R-PO-CH-0808	Failed Patient Run

SPECIMEN

EDTA whole blood sample

EQUIPMENT / SUPPLIES

Hematology analyzer diluent and / or 0.9% saline
Plastic Aliquot tube with cap
Transfer
Calibrated Pipettes
Centrifuge

STEPS

1. Before you start the plasma replacement, run the sample on the automated hematology analyzer and make at least one blood smear to use for slide estimates if needed.

2. Using a transfer pipette, remove a well-mixed aliquot of the original specimen. Pipette the aliquot into the plastic tube and cap. Label tube with two patient identifiers and “plasma replacement”.

   Note: If you are working with a very small sample size, it is advisable to request an additional collection as working with larger volumes is likely to yield more accurate results.

3. Centrifuge the aliquot for 10 minutes at 3400 rpm. **Note:** If using a centrifuge calibrated for platelet-free plasma, use the Time, RPM, Speed, and Deceleration recommended for the specific centrifuge.

4. Remove the specimen from the centrifuge. Mark a line on the exterior of the tube indicating the top of the plasma level.

5. Estimate how many microliters of plasma you can remove without disturbing the buffy coat. Remove that amount of plasma using a calibrated pipette and make note of the amount removed. This will be referred to as the "measured amount" in the following steps. It is VERY important not to disturb the buffy-coat layer.

6. Add back the "measured amount" of diluent. (Prewarmed 37ºC diluent should be used if cold agglutinins are present.)

7. If it looks like the sample has been cleared of the interfering substance, go to step 8, otherwise repeat steps 3 through 6.

   NOTE: It is not unusual to have to repeat the washing several times.

8. Mix the aliquot well and cycle the specimen on the analyzer.

9. Evaluate the printout. Use the RBC (or HGB if it was a cold agglutinin) result as a guide for assessment of proper re-dilution of the specimen.

10. If RBC (or HGB if it was a cold agglutinin) results correlate with the original and the MCHC is within normal reference range, the RBC, HGB, HCT, MCV, MCH, MCHC and RDW from the saline-replaced aliquot may be reported.

    NOTE: See Failed Patient Run Policy for clinically acceptable repeat/correlation limits.

11. Evaluate if the WBC and PLT results correlate with the original results and with a slide estimate. Plasma replacement results might be falsely decreased if the buffy-coat layer has been disturbed.. Report WBC, PLT, and MPV from the original run if slide estimate correlates.

12. If results from the replacement are reported, add a comment in the LIS "Results obtained by plasma replacement".

13. If it was determined that a cold agglutinin was likely, add a chartable comment in the LIS **WARM** "Sample warmed to 37 degrees. Possible cold agglutinin"

14. Review reportable results and determine if manual differential is indicated.

REFERENCE

Hematology Procedures for Abnormal Bloods, Beckman-Coulter Manual, 11, pp. 4.23-4.24.