RBC AGGLUTINATION MANAGEMENT

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PURPOSE

To provide instructions for resolving inaccurate results and flags from the hematology analyzer when RBC agglutination is suspected.

BACKGROUND

Specimens with RBC agglutination may lead to falsely low RBC results and falsely elevated MCV, MCH and MCHC results. This may be flagged on the instrument printout as: H/H Check Failed. Agglutination is often due to cold or warm autoantibodies present in the plasma.

RELATED DOCUMENTS

R-W-HEM1319 Plasma Replacement

SPECIMEN REQUIREMENTS

HANDLING: If possible, maintain specimen at 37ºC after collection
VOLUME: 3-5 ml, whole blood EDTA
STABILITY: 24 hrs, if performed from refrigerated EDTA aliquot

REAGENTS/EQUIPMENT

- 37ºC Heating block or incubator, timer
- Plastic aliquot tubes, transfer pipettes, caps, marking pen
- Analyzer diluent, or 0.9% Normal Saline
- Glass slides

QUALITY CONTROL

1. Slide estimates are performed to correlate automated and manual platelet and WBC results.

INSTRUCTIONS

1. Check for flags or results on the hematology analyzer printout that may indicate RBC agglutination. (i.e. HH Check Failed, Comments: Poss Cold Agg/Lipemia, Warm and/or plasma replacement, or MCHC greater than 37.0 , MCHC +++++).

2. Prepare a slide for review and warm an aliquot of the specimen to 37ºC. for 15-30 minutes. Mix and re-run the sample. Evaluate for the following:
   - If prewarming totally reverses the agglutination and no flags are present, the results may be reported.
   - If prewarming reduces the agglutination, but does not eliminate it, continue with Step 3.
   - If prewarming does not reduce the agglutination, proceed to Step 4.

3. For mild cold agglutinins, perform a 1:2 dilution using warm saline or diluent. If flags and comments and are resolved, results may be verified.

4. Perform a plasma-replacement using WARM (37ºC) diluent or saline. See work instruction, Plasma Replacement, R-W-HEM-1319. Plasma replacement may need to be repeated several times if the cold agglutinin is strong.
5. Compare the WBC, PLT, and HGB results from the original printout with the plasma replacement values to rule out dilutional effects.
6. If dilutional effects are ruled out, and there are no flags, results may be reported. If flags are present, resolve these using normally accepted procedures (i.e. slide estimate for WBC and PLTS)
7. If the saline-replacement did not correct the interference, perform a dilution x2 on the final saline replacement specimen.
8. If there are no flags, and results correlate with the slide estimate, the WBC and PLTS may be reported.
9. The hemoglobin may be reported if it correlates with the original hemoglobin result and no hemolysis or lipemia is present.
10. All other HEMO results should be reported as N/A.
11. Differential: Perform a manual Diff using the original sample if a saline replacement is performed.
12. Add Comment "WARM" (Sample warmed at 37 degrees. Possible cold agglutinin) before verifying results.

TECHNICAL NOTES

1. An elevated MCHC along with an increased MCV is a good indication of a cold agglutinin. However, patients with microcytic RBC's may have an elevated MCHC, with a normal MCV.
2. RBC indices may be manually calculated if requested by physician.
3. In the presence of strong cold agglutinins, the warm saline replacement may be repeated several times to remove additional antibody.

REFERENCE

Coulter Hematology Analyzers: Hematology Procedures for Abnormal Bloods. Beckman-Coulter, April 1999, Procedure 8, RBC Agglutination,pp. 4.15 and 4.16.

DOCUMENT APPROVAL **Purpose of Document / Reason for Change:**			
Updated for current practice			
☐ *No significant change to process in above revision. Per CAP, this revision does not require further Medical Director approval.*			
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