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Schistocyte Review-RO

Document Type: Procedure

I. PURPOSE AND OBJECTIVE:

This procedure provides instruction on performing a schistocyte review.

II. PRINCIPLE:

A. Fragmented red cells are erythrocytes that have undergone rips and tears when draped over fibrin strands in the microcirculation or have suffered buffeting against unyielding structures in the macrocirculation. As erythrocytes pass through a small blood vessel with interlacing fibrin strands across the lumen, they are randomly draped over/around the strands. The pressure of the flowing blood moves the cell forward, but it is haphazardly torn by the fibrin. The cells seal their torn edges and continue in the circulation, presumably for a short time. Eventually, they are sequestered in the spleen. Their presence is a valuable adjunct in assessing the severity of the disease in which they occur.

B. Three subsets are included within the definition of fragmented red cells or schistocytes: 1) helmet cells, 2) triangular cells, and 3) keratocytes. Fragmented cells are seen in severe burns, disseminated intravascular coagulation (DIC), thrombotic thrombocytopenic purpura (TTP), and other microangiopathic hemolytic anemias.

III. SPECIMEN COLLECTION AND HANDLING:

Type	A. Whole blood collected in a vacutainer. This is the preferred sample. -OR- B. Capillary blood collected in a microtainer.
Anticoagulant	K_2EDTA
Amount	A. Whole blood: 1. Minimum sample size is 2.0 mL. 2. Optimum sample size is 4.0 mL. B. Capillary blood: 1. Minimum sample size is 300 mcL.

	2. Optimum sample size is 500 mcL
Special Handling	Specimen must be well mixed for minimum of two minutes before being analyzed.
Timing	Specimen is stable for 8h at room temperature; 72 hours at 4^{o}C. Allow all samples to come to room temperature before being analyzed.
Criteria for Unacceptable Specimens	Specimens containing clots or inappropriate volumes are unacceptable and must be redrawn.

IV. SUPPLIES:

A. **Equipment:**

1. Microscope slides
2. Stainer
3. Microscope

B. **Reagents:** Refer to the procedure, "Blood Smears: Preparation and Staining-RO".

V. CALIBRATION:

See Attachment A for the microscope adjustment (KÖehler illumination) procedure. This should be performed on a daily basis at minimum.

VI. QUALITY CONTROL:

Quality control consists of: (1) visual examination of the smear for quality appearance and successful staining as described in the quality control section of the procedure, "Blood Smears: Preparation and Staining-RO".

VII. PROCEDURE:

A. Specimens requesting a Schistocyte Review may be placed directly on the HST line if they are in a 4 mL lavender tube. A slide will be made and stained at the SP-1000 or SP-50. Alternatively, a manual slide may be made and placed on the SP-1000 or SP-50.

B. When the staining process is complete, examine the stained smear using the 20x dry objective. Place stained smear on the microscope stage. Examine the red blood cell morphology in a thin area of the smear where the RBCs slightly overlap. Determine the average number of schistocytes per high power field **(100x oil)** by averaging the number observed in at least 8-10 fields, using the following grading system when reporting out a Schistocyte Review:

<1	/hpf
1-2	/hpf
3-5	/hpf
6-10	/hpf
11-20	/hpf
>20	/hpf

C. Avoid studying cells too far into the thick or thin areas as cells will be distorted and not show characteristic morphologic features.

D. For any questionable cell identification, seek the review of a second technologist.

VIII. REFERENCES:

A. Lotspeich-Steininger (Koepke), etal, Clinical Hematology: Principles, Procedures, Correlations; 1992.

B. Burns ER, Lou Y, Pathak A. Morphologic Diagnosis of Thrombotic Thrombocytopenia. Am J Hematol 75:18-21, 2004.

C. CAP 2005 Surveys and Anatomic Pathology Education Programs: Hematology, Clinical Microscopy and Body Fluids Glossary, 2005; p.6.

Attachments

ATTACHMENT A - Centering the Condenser (Köelhlering).pdf

Approval Signatures

Step Description	Approver	Date
	Ann Marie Blenc: System Med Dir, Hematopath	1/7/2022
Hematology Medical Director Designee	Ann Marie Blenc: System Med Dir, Hematopath	1/7/2022
Policy and Forms Steering Committee Approval (if needed)	Michele Sedlak: Medical Technologist Lead	1/7/2022
Policy and Forms Steering Committee Approval (if needed)	Gail Juleff: Project Mgr Policy	1/6/2022
	Megan Masakowski: Medical Technologist	1/6/2022
	Michele Sedlak: Medical Technologist Lead	12/14/2021

Applicability

Royal Oak